

The 5th Maghreb Conference on Desalination and Water Treatment CMTDE 2015

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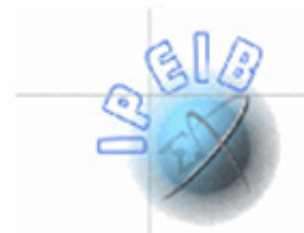
**Ministry of Higher Education
and Scientific Research**



**Ministry of Agriculture, Water
Resources and Fisheries**



**Unité de Recherche Dessalement
et Traitement des Eaux**



TUNISIAN DESALINATION ASSOCIATION (TDA)

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PROGRAM

CMTDE 2015

5th Maghreb Conference on Desalination and Water Treatment

21 - 24 December 2015
Sol Azur Hotel 4^{*}, Hammamet, Tunisia

Organized by



Unité de Recherche
Dessalement et Traitement des Eaux

With the collaboration of



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GUESMI Fatma
BOUGUERRA Wided

PROGRAM OUTLINE

MONDAY DECEMBER 21

15:00-19:00 Registration at Bel Azur Hotel
20:00 Dinner

TUESDAY DECEMBER 22

8:00-9:00 Registration at Bel Azur Hotel
9:00-10:00 **Opening Ceremony at Sol Azur Hotel**
• **Prof. Béchir Hamrouni**, Tunisian Desalination Association President.
• Official Opening : **Prof. Chiheb Bouden**, Minister of Higher Education and Scientific Research.
• **Prof. Miriam Balaban**, General Secretary of European Desalination Society, Editor in Chief of the journal Desalination and Water Treatment.
10:00-10:30 **Conference 1: Prof. Jean François Fauvarque:** Synthesis and characterization of ionically conductive new membranes based on inexpensive materials for electrochemical applications.
10:30-11:00 **Coffee break**
11:00-11:30 **Conference 2: Prof. Mohamed Ben Amor:** Prevention of scaling in drinking water.
11:30-12:00 **Conference 3: Prof. Monem ElHassadi:** Performance experience history of general desalination company of Libya (GDCOL) for the years 2011-2013.
12:00-14:00 **Lunch**
14:00-15:40 **Oral Communications**
Room "Forum" : Desalination processes
Room "Utique" : Pre-treatment and post-treatment
Room "Salambo": Wastewater treatment
15:40-17:00 **Coffee break/ Poster Session 1**
20:00 **Dinner**

WEDNESDAY DECEMBER 23

9:00-9:30 **Conference 4: Prof. Maxime Pontié:** Calcium/Magnesium, Fluoride and Lithium ions extraction efficiency using nanofiltration membranes for brackish/sea waters treatments.
9:30-10:00 **Conference 5: Prof. Sadok Ben Jabbrallah:** Energy aspect of desalination processes.
10:00-11:00 **Coffee break/ Poster Session 2**
11:00-13:00 **Oral Communications**
Room "Forum" : Desalination processes/Energy for desalination
Room "Utique" : Pre-treatment and post-treatment
Room "Salambo": Wastewater treatment
13:00-14:30 **Lunch**
14:30-16:00 **Poster Session 3**
16:00-16:30 **Coffee break**
20:00 **Dinner**

THURSDAY DECEMBER 24

10:00-11:00 **Round Table & Closing session**
12:00 **Lunch**

- CMTDE 2015_191 Removal of cationic dye methylene blue from aqueous solution using a lignocellulosic fibers : Luffa Cylindrica**
A. KESRAOUI, M. SEFFEN
- CMTDE 2015_193 Copper removal from wastewater by electrocoagulation process using aluminum electrodes**
A. BARHOUMI, W. BOUGUERRA, S. NCIB, E. ELALOUI
- CMTDE 2015_197 Surfactant remediation of crude oil-contaminated soil**
S. RAHAL, R. KHALLADI, N. MOULAI-MOSTEFA
- CMTDE 2015_208 Adsorption studies of basic dye on activated carbon derived from Agricultural waste : (ZIZIPHUS JUJUBA) Seed Coat**
O. S. BENTURKI, A. BENTURKI
- CMTDE 2015_216 Aerobic biodegradation of the textile dyes, cibanon navy, solophenyl scarlet and cibacron green**
N. KHELLAF, H. DJELAL, A. AMRANE
- CMTDE 2015_227 Dynamic biosorption of methylene blue by melon peel in fixed-bed columns**
R. KHERRAT, O. HAMDAOUI, Ch. DJELLOUL
- CMTDE 2015_228 Enzymatique traitement of direct yellow 106 by purified peroxidase**
N. BOUCHERIT, M. ABOUSEOUD, L. ADOUR, N. TANDJAOU
- CMTDE 2015_235 Experimental study and mathematic simulation of dehp concentration profiles in a solid pvc discs matrix dipped in methanol.**
A. EL-A. TOUBAL, N. FERTIKH, Dj. MESSADI
- CMTDE 2015_237 Removal of dyes from aqueous solutions by adsorption on the SHRIMP carapace**
I. OULD BRAHIM, M. BELMEDANI, A. BELGACEM, H. HADOUN

- CMTDE 2015_221** **Modification of CMX ion exchange membrane : Effect of temperature on ion exchange equilibrium**
A. CHAABOUNI, F. GUESMI, S. HARBI, Ch. HANNACHI, B. HAMROUNI
- CMTDE 2015_222** **Investigation of the operational parameters on humic acid removal from water by electrocoagulation**
A. BARHOUMI, W. BOUGUERRA, S. NCIB, E. ELALOU
- CMTDE 2015_224** **Application of doehlert experimental design for modification of an anionic membrane by electrodeposition**
M. ARFAOUI, A. OUEJHANI, B. HAMROUNI
- CMTDE 2015_229** **Evaluating the adsorptive capacity of smectite local clay on The removal of several pharmaceutical products in aqueous systems**
I. GHORBEL-ABID, H. KHAZRI, N. WESLATI, S. BOUBAKRI, M. TRABELSI-AYADI
- CMTDE 2015_230** **Ion exchange equilibrium of major inorganic cations (Na⁺, K⁺ and Ca²⁺ on DOWEX 50W×8 resin : Effect of ionic strength**
S. HARBI, F. GUESMI, A. CHAABOUNI, Ch. HANNACHI, B. HAMROUNI
- CMTDE 2015_231** **Removal of fluorides by adsorption onto the modified AFN membrane**
F. GUESMI, Ch. HANNACHI, B. HAMROUNI
- CMTDE 2015_233** **Simultaneous adsorption of Cr (VI) ions and phenol onto granular activated carbon: artificial neural network modeling and central composite design optimization**
D. TABASSI, S. HARBI, B. HAMROUNI
- CMTDE 2015_234** **Boron removal from brackish water by ion exchange resin**
I. DHAOUADI, M. JANDOUBI, M. JOUINI, T. BEN AMOR, H. ELFIL
- CMTDE 2015_236** **Polychlorinated biphenyls in groundwater of grombalia : Optimization of analytical procedures, validation and analysis by gas chromatography coupled with electron capture detector**
A. ATTAYAT, S. KHADHAR, F. OUESLATI, N. MZOUGH
- CMTDE 2015_242** **Contribution to the clarification of surface water from tunisian cactus: Case water dam of Oued El Kebir in ZAGHOUAN, TUNISIA**
Gh. LASSOUED BEN MILED, B. DJOBB, M. H. BAOUAB, R. BEN HASSEN
- CMTDE 2015_243** **Effect of foreign ions on boron determination in tunisian brines**
E. BEN KHALIFA , H. HAMMI, K. TRABELSI, B. HAMROUNI
- CMTDE 2015_244** **Modelisation of equilibrium and kinetic studies of the fluoride sorption onto activated alumina**
M. MOUELHI, I. MARZOUK, B. HAMROUNI
- CMTDE 2015_245** **Effects of temperature on the electrical conduction of polycrystalline silicon thin films for photovoltaic applications**
B. HADJOUJJA, A. Magramene, B. Zaidi, B. Chouial, H. Felfli, S. Gagui, A. Chibani
- CMTDE 2015_246** **Crystalline growth of CuInSe₂ compound for photovoltaic applications**
B. CHOUIAL, K. KAMLI, S. GAGUI, B. HADJOUJJA, A. CHIBANI
- CMTDE 2015_249** **Application of response surface methodology to optimize nitrate removal from water by electrodialysis**
F. GUESMI, S. AMOURI, I. LOUATI, Ch. HANNACHI, B. HAMROUNI
- CMTDE 2015_250** **Evaluation of boron removal from seawater by coagulation-flocculation combined to adsorption**
Kh. MISSAOUI, E. BEN KHALIFA, W. BOUGUERRA, B. HAMROUNI

Wastewater treatment

Chair: Z. BENDJAMA, A. HAFIANE, A. ELHASSADI

- CMTDE 2015_152** **Statistical modeling and optimization of the cadmium biosorption process in an aqueous solution using posidonia oceanic**
L. BRAHMI , F. KAOUAH, S. BOUMAZA , T. BERRAMA, Z. BENDJAMA
- CMTDE 2015_159** **Biodegradation of M-aminophenol by mixed bacteria**
A. HAMITOUCHE, Z. BENDJAMA, A. AMRANE, F. KAOUAH
- CMTDE 2015_186** **Application of bioinoculation to enhance rhizocompetence in bacteria removal of horizontal subsurface flow constructed wetland system**
M. BEN SAAD, M. BEN SAID, L. BOUSSELM, A. GHRABI

CONFERENCE ABSTRACTS

Synthesis and characterization of ionically conductive new membranes based on inexpensive materials for electrochemical applications.

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During the past 10 years, new membranes have been prepared with the help of a small chemical company ERAS Labo. The goal was obtaining inexpensive membranes (no or low fluorine content), ionically conductive, thermo stable, with appropriate mechanical properties.

Anionically conductive membranes have been prepared from commercial poly-epichlorhydrin (PECh), quaternized with diazabicyclooctane (DABCO). Various crosslinks have been studied. Membranes have been used in alkaline fuel cells, batteries and electro dialysis (1,2,3).

Cationic conductive membranes have been obtained from commercial poly- ether sulfone, grafted by SO₂Cl groups (PESS). Softness and crosslinks have been obtained using various amines. The membranes gave nice results for fuel cells, electrolysis and electro dialysis (4,5).

Ionically conductive membranes have been obtained from boron nitride powder bonded with less than 15% fibrillated PTFE (6). The membranes are presently used in large scale (50 and 250 kWe) water electrolysis by the company CeramHyd. Modification of these membranes by conductive polymers (PECh – DABCO or PESS) is under study for electro dialysis.

References

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2. C. SOLLOGOUB, A. GUINAULT, C. BONNEBAT, M. BENNJIMA, L. AKROUR, JF. FAUVARQUE, L. OGIER, Formation and characterization of crosslinked membranes for alkaline fuel cells. *Journal of Membrane Science*, 335 (2009) 37- 42.
3. E. SELMANE BEL HADJ HMIDA, A. OUEJHANI, G. LALLEVÉ, J. F. FAUVARQUE, M. DACHRAOUI, Use of a recent anionic membrane on electro dialysis, application to nitrate and nitrite removal from waste waters, *Desalination and Water Treatment*, 23 (2010) 13–19.
4. W. MABROUK, L. OGIER, S. VIDAL, C. SOLLOGOUB, F. MATOUSSI, M. DACHRAOUI & J.F. FAUVARQUE. Synthesis and characterization of polymer blends of sulfonated polyether sulfone and sulfonated polyethersulfone octylsulfonamide for PEMFC applications, *Fuel Cells*, 512 (2011) 179-187.
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Matériau pour un dispositif électrochimique, Demande de brevet français N° 08 51454 du 6 mars 2008 au nom de CERAMHYD. EP 2253036 A1 du 24 novembre 2010.

Calcium/Magnesium, Fluoride and lithium ions extraction efficiency using nanofiltration membranes for brackish/sea waters treatments

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We will focalize first on the main role play by hydration for the selective elimination (partial or total) of $\text{Ca}^{2+}/\text{Mg}^{2+}$, F^- or Li^+ in presence of Na^+ , Cl^- , with different nanofiltration membranes under different operating conditions (molecular weight cutoff, ionic strength, transmembrane pressure, membrane material, fouling agents, etc).

Three applications will illustrate our introduction:

1-The possibility of producing drinking water from **brackish groundwater polluted with F^-** using NF was previously studied to a pilot scale. Brackish groundwaters were taken from the south of Morocco (Tan Tan city). The performances of few commercialized spiral wound NF membranes *vs* low pressure reverse osmosis and reverse osmosis membranes were compared to a large scale pilot experiments (membrane area 7.6 m²). The following parameters were determined : hydraulic permeability, total salinity, Cl^- , F^- and SO_4^{2-} removals were compared under the influence of various experimental parameters such as conversion, transmembrane pressure, energy consumption and feed compositions. We will also present the first NF plant in the world built in Senegal in 2010 (Thiadiaye city) and dedicated to brackish water defluoridation treatment (fresh water production 33 000 L/h, conversion 70% and a membrane area of 1338 m²), a success story in Africa [1].

2-The possibility of desalinate **moderately brackish waters in algeria** (north Sahara) in presence of Ca^{2+} , Mg^{2+} , colloidal silica and excess Cl^- and Na^+ influenced by surface wastewaters after new coagulation/flocculation/decantation *vs* direct UF/RO operations.

3- The possibility to **separate lithium from salt lake brines from Tunisians Chotts**, using NF and low pressure reverse osmosis membranes. NF90 membrane compared to the XLE appeared more efficient for Li^+ extraction due to its higher hydraulic permeability to pure water and also for a 0.1 M NaCl solution, its lower critical pressure ($P_c = 0$), its higher selectivity between monovalent ions (40%) obtained at low operating transmembrane pressure (below 15 bar). NF90 exhibited 100% rejection of magnesium in a first step separation from brine diluted ten times as only 15% for Li^+ , with a final separation between $\text{Mg}^{2+}/\text{Li}^+$ of 85%. The permeability to the diluted brine was 0.7 L.h⁻¹.m⁻².bar⁻¹ usable to size full scale experiments in the future in order to extract lithium i.e. battery industry. In a second step we have succeeded to separate totally Li^+ and Na^+ by a dialysis separation with NF90. We obtained a total separation between Li^+ and Na^+ with few membranes tested with a 5 times higher diffusion flux (4.42 10⁻⁷ mol.s⁻¹.m⁻² at 20 °C with NaCl 0.1 M) for the NF90 *vs* XLE, [2].

References :

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- CMTDE 2015_169 Adsorption of 2-Nitrophenol by bentonite clay**
A. GHOUDI, S. GUIZA, M. BAGANE
- CMTDE 2015_171 Removal of cadmium and lead from aqueous solution by calcite**
S. HAJJI, Th. TURKI , N. MZOUGH
- CMTDE 2015_174 Calculation of salts activity coefficients in mixed solvents solutions using an adapted Pitzer Model**
N. BOUKHALFA, A-H. MËNIAI
- CMTDE 2015_175 Diffusion and permeation in polymers: consideration on the Deborah number**
N. HASSINI, M. BOUCHAMA, A. DOBBI
- CMTDE 2015_176 Di-M-CHLORIDO-BIS[(2-AMINO BENZAMIDE-K₂N₂,O) CHLORIDOCOPPER(II)]**
M. DAMOUS, G. DËNËS, S. BOUACIDA, M. HAMLAOUI, H. MERAZIG, J. C. DARAN
- CMTDE 2015_179 Silicone rod extraction of cosmetic products in environmental water samples by high-performance liquid chromatography – ultraviolet detection**
M. MALLEK, A. BEN SALAH, V. SALVADO
- CMTDE 2015_180 Determination of the thermodynamic parameters of the adsorption of phenol onto sewage sludge based adsorbent**
S. BOUSBA, A. H. MENIAI
- CMTDE 2015_182 Study of the electrocoagulation of water contaminated with metribuzin. Effect of the nature of the electrode and the inter-electrode distance**
A. SAIBA, S. KOURDALI
- CMTDE 2015_183 Synthesis, characterization of AL-Fe-pillared clays**
S. KHELIFI , F. AYARI, D. BEN HASSAN CHEHIMI
- CMTDE 2015_190 An experimental investigation on flow behaviour in bubble pump of absorption diffusion system**
A. BENHMIDENE, B. CHAOUACHI, S. GABSI, M. BOUROUIS
- CMTDE 2015_194 Preparation and characterisation of polymer inclusion membranes from cellulose triacetate and acetylated lignin for metals separation**
S. NCIB, W. BOUGUERRA, A. BARHOUMI, C. LARCHET, L. DAMMAK, E. ELALLOUI
- CMTDE 2015_198 Removal Of Nickel(II) ions from aqueous solution by an activated carbon prepared from sewage sludge**
A. M. AFFOUNE, O. KHELIFI, M. NACEF
- CMTDE 2015_199 Elimination of nitrate from brackish water in southern Algeria**
I. BERKANI, K. BENSADOK, M. BELKACEM
- CMTDE 2015_202 Use of adsorption using granular activated carbon (GAC) for the enhancement of coagulation performance for boron removal**
W. BOUGUERRA, Kh. MISSAOUI, E. BENKHLIFA, B. HAMROUNI
- CMTDE 2015_203 Elimination du cadmium dans l'eau par adsorption sur les phosphates de calcium**
S. JEBRI, M. BEN AMOR
- CMTDE 2015_205 Corrosion inhibitory evaluation of Anacyclus pyrethrum L. Aqueous extracts on the corrosion of mild steel in acidic medium**
Ch. SELLES, O. BENALI
- CMTDE 2015_207 Oranges peels for biosorption of heavy metals**
Y. ZOUAMBIA, S. ZOUAMBIA, Kh. YUCEF ETOUMI, M. KREA, N. MOULAI MOSTEFA
- CMTDE 2015_210 Corrosion of Zn-Mn alloy coating in carbonated concrete solution**
S. TOUAZI, M. BUČKO, L. MAKHLOUFI, A. LEGAT, J.B. BAJAT
- CMTDE 2015_213 Decarbonation of the geothermal waters of chott el fejjij: Scaling problem and hardness treatment**
A. FARHAT, M. ROMDHANE
- CMTDE 2015_215 Adsorption of cadmium onto activated alumina: Kinetics and thermodynamic studies**
S. MTAALLAH , I. MARZOUK, B. HAMROUNI
- CMTDE 2015_218 Use of electrocoagulation with aluminum electrodes to reduce hardness in Tunisian phosphate process mining water**
Kh. BRAHMI, W. BOUGUERRA, H. BELHSAN, E. ELALLOUI, M. LOUNGOU, Z. TLILI, B. HAMROUNI
- CMTDE 2015_220 Adsorption of Cu(II) from aqueous phase by CEDAR BARK**
O. HAMDALLOUI

- CMTDE 2015_241 Reverse osmosis desalination process combined with solar organic rankine cycle**
B. HAMDI, L. KAROUANI
- CMTDE 2015_248 Intrusion marine de la nappe de Ghar El Melh (Cap-Bon Tunisie) : évaluation de la vulnérabilité par SIG**
F. TLILI, B. BRIK

Pre-treatment and post-treatment

Chair: E. FERJANI, J.F. FAUVARQUE, Ch. HANNACHI

- CMTDE 2015_118 Synthesis and characterization of organophilic clay materials for the removal of Benzoic acid & Salicylic acid in aqueous solutions**
N. DAAS, Dr. H. ZAGHOUE-BOUDIAF
- CMTDE 2015_119 Anti-scale magnetic method as a prevention method for calcium carbonate scaling**
M. SALMAN
- CMTDE 2015_121 Glutamic acid inhibitor for calcium carbonate scaling**
F. NAMOUNE, A. KARAR
- CMTDE 2015_122 Application of doehlert matrix to determine the optimal conditions of bromothymol blue degradation with fenton process**
M. MAAMAR, R. FEZEI, N. SOUSSI, N. BELLAKHAL
- CMTDE 2015_123 Removal of tetracycline from synthetic solution by an electrocoagulation/activated carbon adsorption process: Kinetic and Evaluation cost operating**
Y. AIT OUAISSA, M. CHABANI, A. AMRANE, A. BENSMAILI
- CMTDE 2015_127 An heterotrophic/autotrophic denitrification approach for nitrate removal from drinking water by alfa stems**
K. BENRACHEDI, A. SELATNIA, L. A. BENRACHEDI
- CMTDE 2015_130 Electrochemical impedance spectroscopy study of barium sulfate scale formed from mixture of incompatible waters**
K. LABRAOUI-DJALLAL, M. BOUNOUGHAZ
- CMTDE 2015_141 Scaling the study in the geothermal waters of the northwest of Tunisia**
I. OUNIFI, B. HAMROUNI
- CMTDE 2015_143 Elimination of oxytetracycline by adsorption on synthetic support**
F. BELAIB, A-H. MENIAI, A. MOKRI, B. BOUKELLAL
- CMTDE 2015_149 Optimization of acetic acid adsorption from aqueous solutions by raw phosphate : Full factorial design methodology**
R. SOUADEK , K. RIDA , A. BOUKHEMKHEM
- CMTDE 2015_151 Mesure des propriétés de surfaces de matériaux adsorbants**
H. DEBIH
- CMTDE 2015_153 Molecularly imprinted polyaniline sorbent of sunscreens in water**
Ch. AYADI, S. HBAIEB, R. KALFAT, Y. CHEVALIER
- CMTDE 2015_158 Caractérisation et modélisation du mouvement du lit de boues dans les décanteurs secondaires**
T.F BOUKEZOULA., Z. BAKIRI
- CMTDE 2015_160 Lead(II) and cadmium(II) elimination from aqueous solutions by commercialized resin : LEWATIT TP 214**
O. ABDERRAHIM, E. BENAÏSSA, M. A. DIDI
- CMTDE 2015_162 Decomposition of pharmaceuticals in wastewater by ionizing radiation**
W. JAHOUACH-RABAI, Z. AZZOUZ-BERRICHE, R. LAHSNI, B. HABIBI, L. BOUSSELMY, A. GHRABI
- CMTDE 2015_163 Using brick waste for leachate concentrate treatment by solidification/stabilization process**
A. KALLEL, M. ZAÏRI, I. TRABELSI
- CMTDE 2015_164 Removal of zinc ions from brackish water using natural Algerian (NAB) bentonite**
A. FADEL, A. HAFIANE, S. NACEF
- CMTDE 2015_168 Calcium sulfate and carbonate co-precipitation**
Y. ZARGA, K. MAKLOUF, H. ELFIL

**PERFORMANCE EXPERIENCE HISTORY OF GENERAL DESALINATION COMPANY OF LIBYA
(GDCOL) FOR THE YEARS 2011-2013
PART I: COST & OPERATIONAL PARAMAMETERS**

Abdulmonem A. Elhassadi^{1*}, Sofian A. Benmussa² & Mohammed A. Haslook²

¹Chairman of General Desalination Company, Benghazi, Libya

² General Desalination Company of Libya (GDCOL)

Previous Head of Chemical Engineering Department, Benghazi University, Benghazi, Libya
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Performance experience history of general desalination company for the years 2011-2013 is evaluated through cost analysis studies of different parameters such as cost, produced water, and chemical, fuel, and energy consumptions. Statistical regression analysis of these parametric studies for the different data points is conducted with simple linear regression to illustrate the behavior of the different relations in order to test, justify, modify, and approve the behavior of the different plants in the different cities that constitute the Sea Water Desalination River (SWDR), to check the

- performance and efficiency of all plants
- competitiveness of the different plants
- human resource development working in the different plants
- decision making process for future planning

The results gained from this study will help greatly in evaluating the performance of the general desalination company for consecutive three years plan, started in 2008-2010 (previous paper, CMTDE2011) and now 2011-2013 (for this paper, CMTDE2015) and at this early stage of its history and will be a good indicator for future predictions, developments and planning.

Keywords: Cost, produced water, chemical, fuel, and energy consumptions

Energy aspect of desalination processes.

**Prof. Sadok BEN JABRALLAH, Faculty of sciences of Bizerte, Carthage university,
e-mail: sbenjabrallah@gmail.com**

The freshwater resources in the world, responding to population growth and increasing human needs become insufficient and are increasingly threatened by any kind of pollution. To solve this problem of shortage of drinking water sources, we often use desalination.

Desalination processes have a remarkable development. However, they still remain major consumers of energy. Much of the cost of desalinated water is defined by the price of energy.

for each process, we indicate the different forms of energy requirements and we are studying the possibilities to reduce consumption. We envision coupling with renewable energy and particularly solar energy and geothermal water. As examples, we present a few pilot installations operating in real sites, in different regions of the world.

Keywords: Desalination, energy consumption, processes, production.

**TUESDAY AFTERNOON
DECEMBER 22, 2015**

Room Forum

Desalination processes/Energy

Chair: S. GABSI, L. KAIROUANI

- 14:00-14:20 **CMTDE_137: Simulation studies on the solar vacuum membrane distillation equipped with a helically coiled fibers**
A. ZRELLI, B. CHAOUACHI, S. GABSI
- 14:20-14:40 **CMTDE_140: Development of a pilot industrial unit desalination of sea water using tidal energy installed on the sea water discharge canal in the site Jorf Alasfar OCP Morocco**
D. SAIFAoui, Y. AAROUSSY, H. HASSOUN, I. CERHANE
- 14:40-15:00 **CMTDE_145: Numerical and experimental study of evaporation of liquid effluent on an inclined plate**
H. ZOUAGHI, S. BEN JABRALLAH, S.HARMAND
- 15:00-15:20 **CMTDE_226: Multi-objective optimization of operating parameters of a MSF-BR desalination plant using pareto-optimality**
M. BEN ALI, L. KAIROUANI
- 15:20-15:40 **CMTDE_112: Use of water desalination in agriculture : Case of Smar Medenine**
S. SAHAL, A. MHIRI

**TUESDAY AFTERNOON
DECEMBER 22, 2015**

Room Utique

Pre-treatment and post-treatment

Chair: J.F. FAUVARQUE, E. FERJANI

- 14:00-14:20 **CMTDE_35: Corrosion and Scaling Problems in Libyan Sea Water Desalination Plants**
A. M. ELWAER, M. ELHAMILE GIUMA HAKAM, A. Ahmed
- 14:20-14:40 **CMTDE_74: Removal of samarium (III) from aqueous solutions by Poly(Sodium 4-Styrenesulfonate) and Poly(Acrylic Acid) assisted-ultrafiltration**
M. HAMMAMI, D. JELLOULI ENNIGROU, K. HORCHANI NEIFER, F. MOKHTAR
- 14:40-15:00 **CMTDE_223: Recovery of copper ions by supported liquid membrane (SLM) extraction**
S. NCIB, W. BOUGUERRA, A. BARHOUMI, E. ELALOUI
- 15:00-15:20 **CMTDE_195: Defluoridation of drinking water using functionalized SBA-15 type ordered mesoporous silica**
T. BEN AMOR, A. HAMROUNI, M. BEN AMOR
- 15:20-15:40 **CMTDE_167: Development of a scale model for fouling factor calculation in desalination plants**
K. BOUROUNI, T. JABER, S. BEN JABRALLAH
- 15:40-16:00 **CMTDE_206: Interaction of polystyrene co styrene sulfonate with methylene blue as a function of physical chemical parameters in aqueous solution**
W. ESSAFI, S. BEN MAHMOUD, A. H. HAMZAOUl.

- CMTDE 2015_138 Electro-kinetic removal of heavy metals from sludge generated during a wastewater treatment**
M. CHERIFI
- CMTDE 2015_139 Activated carbon prepared from date stone by physical activation: Characterization and adsorption of dye**
S. REZMA, R. LAFI, A. HAFIANE
- CMTDE 2015_147 Synthesis of ZnO NPs by thermal decomposition of acetate of zinc dehydrate and its high rate of adsorption of methylene blue**
H. CHMINGUI
- CMTDE 2015_148 Spectrophotometric study of the interaction of cationic dyes with anionic polyoxometalates**
M. KAHLOUL, A. HAFIANE
- CMTDE 2015_154 Degradation of reactive dyes by gamma irradiation process**
W. JAHOUACH-RABAI, Z. AZZOUZ-BERRICHE, B. CHAMMAM, L. BOUSSELMI, A. GHRABI
- CMTDE 2015_155 Application of 2D electrical resistivity tomography method and geochemical tracers for delineation of groundwater recharge by treated wastewater from Dhraa Tammar wastewater treatment plant in Kairouan region (Central Tunisia)**
F. LACHAAL, M. M'RABET, Y. MANSOURI, H. GABTNI
- CMTDE 2015_165 Influence of operating conditions on the performance of coagulation-flocculation as pretreatment of tannery wastewater**
A. BEN GAMRA, H. BOZRATI, Ch. FERSI, Ch. GORGI, A. TOUMI
- CMTDE 2015_172 Elimination of heavy metals by a treated aquatextile**
S. ZOUAMBIA, Y. ZOUAMBIA, N. HACHACHE
- CMTDE 2015_173 Adsorption of acid dye onto bentonite and organophilic bentonite**
F. AYARI, E. SRASRA, M. TRABELSI AYADI
- CMTDE 2015_181 Degradation of red acid utilized in algeria textile industries by electro-fenton : Optimization assessment of toxicity using biomarkers of oxidative stress**
S. KOURDALI, A. BADIS, A. BOUCHERIT, A. SAIBA
- CMTDE 2015_184 Effective approach to remove heavy metals from water using an aquatic plant**
A. NEMAMCHA, F. Z. BOUZIT, H. MOUMENI
- CMTDE 2015_189 Application of photoactivated periodate to the degradation of anthraquinonic dye in water**
H. GHODBANE Houria, O. HAMDAOUI

DECEMBER 23, 2015
WEDNESDAY FROM 14:30 TO 16:00

Poster
Session 3

Desalination processes/Energy

Chair: S. FRIQUI, L. KAIROUANI, S. BEN JABRALLAH

- CMTDE 2015_192 The use of mlp neural network for removal 4-chlorophenol by membrane liquid emulsion**
N. MESSIKH
- CMTDE 2015_196 Heat and mass transfer by natural convection in partially porous cavities**
N. HADIDI, R. BENNACER, Y. OULD-AMER
- CMTDE 2015_211 Un marché d'échange des droits d'accès à l'eau en Tunisie**
I. ASKRI, M. A. BCHIR, M. BALLOUMI
- CMTDE 2015_238 Modelling of water desalination by electro dialysis processes**
S. GMAR, A. CHAGNES, I. BEN SALAH SAYEDI, J. F. FAUVARQUE, M. TLILI, M. BEN AMOR
- CMTDE 2015_239 Dessalement par compression de vapeur**
A. SELLAMI, L. KAIROUANI
- CMTDE 2015_240 Thermal desalination process combined with organic rankine cycle**
N. TOUJENI, L. KAIROUANI

- CMTDE 2015_90 Optimization of electrochemical zinc recovery process: Effect of the presence copper and surfactant in chloride medium of pH=3**
N. TOUABI, M. BOUNOUGHAZ, S. MARTINEZ
- CMTDE 2015_91 Depollution of industrial waters loaded in hexavalent chromium by electrosorption/CDI : Optimization of treatment process (pH, Flow, Voltage, Contact Time)**
H. SENOUSI, K. E. BOUHIDEL
- CMTDE 2015_94 Analyse et spéciation des métaux lourds dans le barrage de timgad (BATNA)**
Ch. AMRANE, K. E. BOUHIDEL
- CMTDE 2015_97 Removal of acetic acid from aqueous solutions by raw phosphate : Kinetic and equilibrium studies**
R. SOUADEK, K. RIDA
- CMTDE 2015_99 Degradation of tiemonium methyl sulphate by adsorption on lichens**
F. AGUENIOU, A. BOUGUETTOUCHA, D. CHEBLI
- CMTDE 2015_103 Kinetic and thermodynamic study of the Amoxicillin elimination on activated carbon of vegetable origin**
S. BENREDOUANE, T. BERRAMA, N. DOUFENE, S. DADOU
- CMTDE 2015_107 Selective recovery of heavy metals from electroplating Sludge: Experimental And Modeling**
H. SENOUSI, K. E. BOUHIDEL
- CMTDE 2015_111 Enhanced removal of bisphenol a by low cost alginate/organo acid activated bentonite composite beads : Equilibrium Isotherms, Kinetic And Thermodynamic Studies**
N.DJEBRI, M. BOUTAHALA, N. CHELLELI
- CMTDE 2015_117 Efficiently monitoring corrosion inhibitors of carbon steel in seawater**
H. KHALED
- CMTDE 2015_129 Study of the degradation and the mineralization of isoprocab insecticide in aqueous medium by the electro fenton process**
H. BAKHTI, N. BEN HAMIDA, D. HAUCHARD

Wastewater treatment

Chair: A. HAFIANE, Ch. HANNACHI

- CMTDE 2015_66 Rural wastewater treatment by infiltration percolation process on a reconstituted silica sand filter and swelling clay**
S. ETURKI, N. JANNÈNE, N. JEDIDI, HBEN DHIA
- CMTDE 2015_116 Brewery industrial wastewater characterization in sahel region: the case of Brakina in Burkina Faso**
B. SAWADOGO, Y. KONATE, G. LESAGE, M. HERAN, A. H. MAIGA
- CMTDE 2015_124 Control of recycle sludge in activated sludge process using adaptive neuro-fuzzy logic controller (ANFIS)**
R. MAACHOU, A. LEFKIR, A. BERMAD, A. KHOUIDER
- CMTDE 2015_131 Adsorption of anionic dye "methyl orange" on the prepared activated carbon from pine cone**
A. REFFAS, L. DUCLAUX
- CMTDE 2015_133 Development of an industrial unit pilot desalination of sea water using heat from sulfuric Units OCP JORF AL ASFAR MOROCCO**
D. SAIFAOU, Y. AAROussy, H. HASSOUN
- CMTDE 2015_134 High conductivity induced solute leakage in seed imbibed with wastewatertreated with lagooning treatment**
T. MISSAOUI, M. SMIRI, A. HAFIANE
- CMTDE 2015_135 Chemical fluxes study at the sediment-water interface to assess the general scheme of the early diagenesis occurring off the Mejerda Outlet (Gulf Of Tunis)**
M. A. HELALI, N. ZAABOUBA, W. OUESLATI, A. ADDED
- CMTDE 2015_136 Enoxacin degradation by photo-fenton process: Optimization and biodegradability improvement**
C. ANNABI, F. FOURCADE, A. ASSADI, I. SOUTRE, A. AMRANE, N. BELLAKHAL

TUESDAY AFTERNOON
DECEMBER 22, 2015

Room Salambo

Wastewater treatment

Chair: L. BOUSSELMI, A. HAFIANE

- 14:00-14:20** **CMTDE_34: Studies of methylene blue removal efficiencies from aqueous solutions through photocatalytic process in presence of heavy metal**
A.A. AZZAZ, A.A. ASSADI, A. BOUZAZA, S. JELLALI, L. BOUSSELMI, D. WOLBERT
- 14:20-14:40** **CMTDE_178: Removal of micro-pollutants using membrane bioreactor (MBR) as an advanced wastewater treatment technology**
M. CHTOUROU, K. WALHA, Q. COMAS
- 14:40-15:00** **CMTDE_125: Endocrine disrupting compounds identification in water matrices_case study in TUNISIA**
S. ETTEIEB, A. KAWACHI, J. HAN, J. TARHOUNI, H. ISODA
- 15:00-15:20** **CMTDE_28: Effect of coating methods and cyclic voltammetry on electrochemical degradation of amaranth dye using stainless steel/PbO₂ anode**
I. ELAISSAOUI, H. AKROUT, L. BOUSSELMI
- 15:20-15:40** **CMTDE_132: Removal of lps endotoxin from reclaimed wastewater through adsorption using soil**
M.GUIZANI, H. KATO, N. FUNAMIZU

WEDNESDAY MORNING
DECEMBER 23, 2015

Room Forum

Desalination processes/Energy

Chair: D. SAIFAOU, S. FRIOUI

- 11:00-11:20** **CMTDE_46: Membrane Crystallization: applied to crystallize Sodium Sulfate from super-saline solution**
R. BOUHRIT, A. BOUBAKRI, S. T. BOUGUECHA
- 11:20-11:40** **CMTDE_200: An investigation of the performance of a solar vacuum membrane distillation operating a reverse osmosis desalination process in an arid area: A case study from the south of Algeria**
Z. TRIKI, M. N. BOUAZIZ, M. BOUMAZA
- 11:40-12:00** **CMTDE_166: Productivity study of various configurations of desalination by vacuum membrane distillation coupled with solar energy**
N. FRIKHA, S. BENABDALLAH, S. GABSI
- 12:00-12:20** **CMTDE_201: Mathematical modeling and numerical study of heat and mass transfer in humidifier and condenser for solar humidification dehumidification desalination system**
H. GOUIDER, L. ZILI-GHEDIR, S. BEN NASRALLAH
- 12:20-12:40** **CMTDE_217: Etude geochemique, mineralogique et optimisation du processus de cristallisation par energie solaire: Cas de salin du chott Merouane El Oued (Algerie)**
M. BOUNOUALA, S. REMLI
- 12:40-13:00** **CMTDE_177: Nanofiltration versus reverse osmosis for brackish water desalination**
K. MINYAOU, M. PONTIE, A. HANNACHI

**WEDNESDAY MORNING
DECEMBER 23, 2015**

Room Utique

Pre-treatment and post-treatment

Chair: E. FERJANI, H. ELFIL

- 11:00-11:20 **CMTDE_188: Micro-channel cell for the extraction of ionic metal (Zn(II)) using polymer plasticized membranes**
S. BELLOUL-SAHI , O. SENHADJI-KEBICHE , S. TINGRY, M. BENAMOR
- 11:20-11:40 **CMTDE_247: Application of a solid phase extraction for chromium speciation in industrial effluent using electrothermal atomic absorption spectrometry**
M. NAFTI, Ch. HANNACHI, R. CHAKROUN, B. HAMROUNI, H. NOUAÏGUI
- 11:40-12:00 **CMTDE_214: Optimization of cadmium removal by donnan dialysis**
S. MTAALLAH, I. MARZOUK , B. HAMROUNI
- 12:00-12:20 **CMTDE_156: Comparative study of the performance of water treatment processes for haemodialysis applied in two dialysis units and their impact on the quality of produced water**
M.I. MIME, Z. BENGHAREZ, K. BENRACHEDI
- 12:20-12:40 **CMTDE_23: Anionic membrane modified and behavior with synthetics and real water in electrodialysis**
E. SELMANE BEL HADJ HMIDA, T. OUNISSI, M. REKIK, J.F.FAUVARQUE

**WEDNESDAY MORNING
DECEMBER 23, 2015**

Room Salambo

Wastewater treatment

Chair: Z. BENDJAMA, A. HAFIANE, A. ELHASSADI

- 11:00-11:20 **CMTDE_128: Aqueous processing of insecticide by electrochemical advanced oxidation process "electro-fenton": the degradation and the mineralization of promecarb**
H. BAKHTI, N. BEN HAMIDA, D. HAUCHARD
- 11:20-11:40 **CMTDE_225: Study of the impact of mine waste on the ground, and surface water sulfur contamination as a result of acid mine drainage (AMD).**
M. L.BOUKELLOUL, M. BOUNOUALA, K. TALHI, A. IDRES, L. GADRI
- 11:40-12:00 **CMTDE_219: Ballasted electroflocculation: An innovative wastewater treatment process**
K.BRAHMI, W. BOUGUERRA, M. LOUNGOU, B. HAMROUNI
- 12:00-12:20 **CMTDE_82: Application of central composite design and artificial neural network for simultaneous adsorption of Cr(VI) and phenol from aqueous solution using ion exchange resin DOWEX 1X8**
S. HARBI, D. TABASSI, F. GUESMI, Ch. HANNACHI, B. HAMROUNI
- 12:20-12:40 **CMTDE_32: Study of the efficiency of Si/BDD electrode in nitrate and organic matter removals of different real effluents**
M. GHAZOUANI, H. AKROUT, L. BOUSSELM
- 12:40-13:00 **CMTDE_144: Synthesis and characterization of pebax and pvdF based composite membranes : Application for dye removal by ultrafiltration**
S. BEN HAMOUDA, Y. GOUIDER, A. HAFIANE

CMTDE 2015_204 **Synthesis and characterization of new proton exchange membrane deriving from sulfonated polyethersulfone using ionic cross linking for electrochemical applications**
W. MABROUK, S. VIDAL, C. SOLLOGOUB, F. MATOUSSI, A. HAFIANE, J. F. FAUVARQUE

CMTDE 2015_232 **Removal of boron from geothermal water by reverse osmosis and other physico-chemical processes**
J. KHRIJI, I. LOUATI, B. HAMROUNI

Pre-treatment and post-treatment

Chair: H. ELFIL, E. FERJANI, A. ELHASSADI

CMTDE 2015_59 **Cr (VI) removal from aqueous solution by alfa grass : Kinetic, equilibrium and thermodynamic study**

L. DJEKOUNE, Z. SALEM, R. CHEMINI, L. BOUMEHDI, K. ALLIA

CMTDE 2015_61 **Investigation of chromium (VI) adsorption in agricultural soils using batch experiment**

F. BENMAHDI, S. SEMRA, M. BOUHELASSA

CMTDE 2015_62 **Study of the adsorption performance of the alga *Corallina elongata* as a biosorbent for acetic acid**

F. BOUREMMAD, A. BOUCHAIR, L. KENDOULI

CMTDE 2015_65 **Effect of surfactant nature on the physico chemical and rheological properties of micellar systems : method of design of experiments study**

M. NEDJHIOUI, N. MOULAI-MOSTEFA

CMTDE 2015_67 **A clean technology for tanneries unhairing waste waters : neutralization by CO₂ , water recycling and free amino acids recovery**

S. TAMERSIT, K. BOUHIDEL

CMTDE 2015_68 **Etude du traitement d'un rejet hydrique industriel hautement chargé en Fluor**

I. BEN BELGACEM

CMTDE 2015_70 **Silicates enhanced heavy metals removal from aqueous solutions by Tunisian natural limestone**

A. SDIRI, S. BOUAZIZ, F. JAMOSSI, T. HIGASHI

CMTDE 2015_71 **Treatment of bilge water by adsorption process on Pretreated EGGSHELL**

F. ATMANI, N. YEDDOU-MEZENNER

CMTDE 2015_73 **Effect of biopolymer addition on some physic-chemical properties of anionics surfactants/oil/water systems**

M. NEDJHIOUI, N. MOULAI-MOSTEFA, Y. BELHADJ, M. TIR, A. SKENDER

CMTDE 2015_75 **Kinetics study of the photodegradation of nystatin**

A. BOUCENNA, S. BOUAFIA-CHERGUI, M. CHABANI, A. AMRANE, A. BENSMAILI

CMTDE 2015_76 **Potential of H₂SO₄ pretreated cupressus semperviren forest waste biomass for the removal of Methylene blue from aqueous solutions**

A. REFFAS, A. BOUGUETTOUCHA, D. CHEBLI, A. AMRANE

CMTDE 2015_78 **Removal of nickel ions onto NaY Zeolite: Characteristics, kinetic and thermodynamic study**

EL H. MEKATEL, S. AMOKRANE, A. AID, N. KERBACHENE, M. TRARI, Dj. NIBOU

CMTDE 2015_83 **Water treatment with Clay-Carbon adsorbent**

Ch. MEZITI, A. BOUKERROUI, B. CAGNON

CMTDE 2015_84 **Optimized experimental conditions and new kinetic parameters for iron removal from water using calcite as removal agent.**

A. HAMDOUNI, G. M. HERNANDEZ, M. TLILI

CMTDE 2015_86 **Iron removal from water by electrocoagulation**

A. ATTOUR, Y. BEN KHEMIS, M. BEN AMOR, F. LAPICQUEC, J.P. LECLERC

CMTDE 2015_87 **A comparative study between chemical coagulation and electrocoagulation by treatment of landfill leachate effluent**

A. RABAHI, M. BENCHIKH ELHOCINE

CMTDE 2015_88 **Etude de processus de desorption de produit 2-4D dans le sol**

M. KOLLI, F. BENMAHDI, S. SEMRA, M. BOUHELASSA

- CMTDE 2015_100 Treatment of concentrate sanitary landfill leachate by anodic oxidation and electro-Fenton combined processes) ; (Calibri, Bold, size 13)**
L. LABIADH, A. FERNANDES, L. CIRÍACO, M.J. PACHECO, A. GADRIB, S. AMMAR, A. LOPES
- CMTDE 2015_102 Parametric study on the effect of the ratios $[H_2O_2]/[Fe^{3+}]$ and $[H_2O_2]/[Substrat]$ on the fenton degradation of oxytetracycline**
W. EL KHIR, S. BOUAFIA-CHERGUI, M. CHABANI, A. AMRANE, A. BENSMAILI
- CMTDE 2015_104 Dimethyl phthalate DMP removal from aqueous solution by activated carbon prepared from a high biomass productivity : Isotherm equilibrium study**
N. DOUFENE, T. BERRAMA, S. BENREDOUANE, Ch. NEKAA
- CMTDE 2015_108 The equilibrium and kinetics studies of diclofenac sodium adsorption onto Organophilic K10 montmorillonite (MK10-C16)**
N. BOUKHALFA, M. BOUTAHALA

DECEMBER 23, 2015
WEDNESDAY FROM 10:00 TO 11:00

Poster
Session 2

Desalination processes/Energy

Chair: S. GABSI, A. HANNACHI, L. KAIROUANI

- CMTDE 2015_101 Water recycling and free amino acids recovery from wheat washing waters by an hybrid process : Bentonite / Microfiltration / Electrodeionization**
S. AOUN, T. BENZEDIRA, K. E. BOUHIDEL
- CMTDE 2015_110 Performances of the MSF plant in terms of Maintenance and reliability**
S. FRIQUI
- CMTDE 2015_113 Inhibition of calcium carbonate scale by using an aqueous extract of olive leaves**
A. KAHOUL, R. AIDOU
- CMTDE 2015_114 Recovery of penicillin v by frontal microfiltration**
SAMAI M., M. CHIKHI
- CMTDE 2015_115 $CuBi_2O_4/ZnO$ novel hetero-system for the chromate reduction (water depopulation) under solar light**
H. AHMAR, A. KECITA, M. TRARI
- CMTDE 2015_120 Optimization of a cloud point extraction protocol for hexavalent and trivalent chromium separation and speciation in aqueous samples**
M. NAFTI, Ch. HANNACHI, R. CHAKROUN, J. HSEINI, H. NOUAÏGUI, B. HAMROUNI
- CMTDE 2015_126 Alfa stems (STIPA Tenacissima L) as substrate for water denitrification**
K. BENRACHEDI, A. SELATNIA, L.A. BENRACHEDI
- CMTDE 2015_142 Fabrication and characterization of composite nanofiltration membranes by interfacial polymerization.**
I. OUNIFI, A. HAFIANE, E. FERJANI
- CMTDE 2015_146 Optimization of process parameters for the removal of fluoride by membrane distillation using response surface methodology approach**
A. Boubakri, R. Bouchrit, A. Hafiane, S. T. Bouguecha
- CMTDE 2015_161 Numerical study of the humid air condensation in a condenser of a solar desalination unit**
S. SAIDI, R. BEN RADHIA, B. BENHAMOU, N. NAFIRI, S. BEN JABRALLAH
- CMTDE 2015_170 Electrodialysis as membrane process for nitrate removal from drinking water : Effects of the accompanying components**
Th. TURKI, M. BEN AMOR
- CMTDE 2015_185 Elaboration and characterisation of nanoporous ceramic membranes for water nanofiltration process**
H. MOUMENI, F. ROUABHIA, A. NEMAMCHA, J. L. REHSPRINGER

DECEMBER 22, 2015
TUESDAY FROM 15:40 TO 17:00

**Poster
Session 1**

Desalination processes/Energy

Chair: L. KAIROUANI, S. BEN JABRALLAH, A.ELHASSADI

- CMTDE 2015_1** **Evaluation of the performances of four hybrid photovoltaic/thermal collectors (HPV/T)**
A. GHELLAB, A. KAABI, I. Louni, S.E. Guendouzi
- CMTDE 2015_2** **Modelling of temperature for simple solar still hybrid with heat pump (SSDHP).**
K. HIDOURI, S. GABSI
- CMTDE 2015_16** **Experimental optimization of a solar still using solar energy**
K. ZARZOOM, Kh. ZHANI, H. BEN BACHA
- CMTDE 2015_19** **Effect of internal and external parameters on the performance of solar still**
A. TRAD
- CMTDE 2015_20** **Study of the coupling of multi effects desalination unit to solar parabolic trough concentrator (MED-Pt) in the southern region of ALGERIA**
M. ABBAS, A. HAMADENE, H. ABURIDEH and Z. TIGRINE
- CMTDE 2015_22** **Polymeric anion exchange membrane modified (PAEMm) and electro dialysis**
T. OUNISSI, E. SELMANE BEL HADJ HMIDA, J.F. FAUVARQUE
- CMTDE 2015_25** **The elimination of penicillin V by a membrane process of tangential microfiltration**
M. SAMAI, M. CHIKHI
- CMTDE 2015_30** **On the use of solar vacuum membrane distillation as an integrated desalination process for the treatment of reverse osmosis brines : A case study from the south of ALGERIA**
Z. TRIKI, M. N. BOUAZIZ, M. BOUMAZA
- CMTDE 2015_38** **A dynamic modelling approach of a Chemostat**
M. HMISSI, J. HARMAND, H. SHAYEB
- CMTDE 2015_42** **Elaboration and characterisation of Carbon Ultrafiltration Membrane: Application to membrane distillation**
I. DERBEL, R. BEN AMAR
- CMTDE 2015_45** **Fouling in Seawater Ultrafiltration Process: Mechanisms and Screening Studies**
F. Z. SLIMANE, G. BEN MILED, S. ALLOUCHE, F. ELLOUZE, N. BEN AMAR
- CMTDE 2015_47** **Denitrification of underground water by electro dialysis: Effect of chloride and sulphate ions**
S. GMAR, I. BEN SALAH, M. TLILI, M. BEN AMOR
- CMTDE 2015_63** **Numerical simulation of a simple solar still**
Y. SARRAY, N. HIDOURI, A. MCHIRGUI, A. BEN BRAHIM
- CMTDE 2015_85** **Etude de la dégradation du p-Nitrophénol par les procédés d'oxydation avancée en milieu homogène**
K.H. TOUMI, D. CHEBLI, T. MEKHALIF, S. NACEF
- CMTDE 2015_92** **Nitric acid-metals waste waters from a brass pickling used bath: separation, purification and recycling by an hybrid process diffusion dialysis-selective physico-chemical methods.**
Ch. AMRANE, A. LALMI, K. E. BOUHIDEL
- CMTDE 2015_93** **Electroplating sludge lixiviation: recovery of acids, bases and metals by diffusion dialysis**
Ch. AMRANE, K. E. BOUHIDEL
- CMTDE 2015_95** **Condensate recovery improvement by installation a heat exchanger**
R. CHEMINI, K. SADOUNI, A. MENOUN
- CMTDE 2015_98** **Study of the formation of a heteropolyanionic complex (P₂W₁₅MO₂PBO₆₁)₈₋ and regeneration by emulsified liquid membrane**
N. ZABAT, M. ABBESSI

- CMTDE 2015_3** **Research fertilizing potential of treated water at the Mitidja plain (ALGERIA)**
M. NAKIB, A. BERREKSI, A. KETTAB, S. HOULI
- CMTDE 2015_5** **UV and solar photo-degradation of naproxen: reaction kinetics, products identification and toxicity assessment**
N. JALLOULI, K. ELGHNIJI, O. HENTATI, A.R. RIBEIRO, M.T.S. ADRIÁN, M. KSIBI
- CMTDE 2015_12** **Preparation of new organoclays and applications for the adsorption of textile dyes from aqueous solutions**
B. MAKHOUKHI
- CMTDE 2015_17** **Heavy metals in sanitation systems**
Z. HABES, R. S. AMIRI, A. MOKHNACHE, N. CHAKRI, D. MESSADI
- CMTDE 2015_21** **Adsorption des métaux lourds par la marne argileuse en solution aqueuse**
B. BENGUELLA
- CMTDE 2015_24** **Study on the removal of turbidity and color related to the presence of iron in the natural water by adsorption on column by charcoal of aleppo pine wood**
M. RUITI, B. BEN THAYER
- CMTDE 2015_26** **Removal of turbidity from ghdir el golla natural water : A comparative study between electrocoagulation and chemical coagulation processes**
A. ATTOUR, S. BRAIK, M. BEN AMOR, F. LAPICQUE, J.P. LECLERC
- CMTDE 2015_29** **Removal of amoxicillin and ampicillin antibiotics from aqueous solution using an anionic surfactant**
A. BOUKHELKHAL, O. BENKORTBI, S. HANINI
- CMTDE 2015_31** **Study of the effectiveness ibn ziad station to purify urban and industrial water for the constantine city using activated sludge**
S. GHIZELLAOUI, S. GHIZELLAOUI,
- CMTDE 2015_33** **Inhibition of scaling in hard water**
S. GHIZELLAOUI, R. MENZRI
- CMTDE 2015_36** **Impact of Starch glue presence in liquid phase on bubble hydrodynamic in electroflotation process**
K. HMIDI, I. KSENTINI, L. BEN MANSOUR
- CMTDE 2015_37** **Application of Capacitive Deionization (CDI) to NH₄⁺, Pb²⁺ and Cr⁶⁺ Pollutants Removal**
H. SENOUSSE, K. E. BOUHIDEL
- CMTDE 2015_39** **Removal of acid red 336 from aqueous solution by continuous electro-coagulation : influence of the type of current and electrodes connections**
A. AMOUR, B. MERZOUK, M. TIAIBA, J.P. LECLERC, F. LAPICQUE
- CMTDE 2015_41** **Optimization of the coagulation-flocculation process for pulp and paper mill effluent treatment from a Tunisian plant**
A. LTIFI, N. SAIDI, M. RABHI, A. HAFIANE, A. SMAOUI, CH. ABDELLY
- CMTDE 2015_43** **Equilibrium, kinetics and mechanism for the removal of rhodamine B by sorption on okoume SAWDUST from aqueous MEDIA**
E.Kh. GUECHI, O. HAMDAOUI, Dj. BEGGAS
- CMTDE 2015_44** **Study of the Early Stages of Calcium Carbonate Formation**
R. HAMDI, M. BEN AMOR, M. M. TLILI
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