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# **Scientific Diasporas: From Brain Drain to Brain Gain**

January the 12th and 13th in Geneva

**Workshop organized by the “Sharing Knowledge Foundation”**

Career Abroad and Reintegration in the Country of  
Origin : Testimony of a Moroccan Researcher

Azzeddine ELMIDAQUI



# Career Abroad and Reintegration in the Country of Origin : Testimony of a Moroccan Researcher

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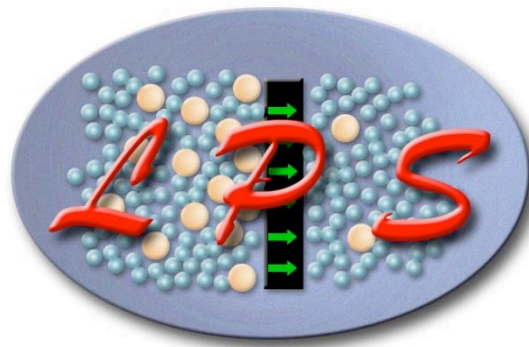
- **Azzeddine Elmidaoui/Claude GAVACH**
- **PROFESSION:** Professor. Laboratory of Separation Processes, Faculty of Sciences, University Ibn Tofail, Kénitra, Morocco.
- **DATES of BIRTH :** 1959, Morocco.
- **Study Period in Europe :** 1983-1991, 09 years in France (CNRS, Montpellier)
- **Date of Reintegration :** 1991, November



# LABORATORY OF SEPARATION PROCESSES



**1991-1992 : Tetouan/Paris/Rennes/Colorado/Berlin**  
**1993 : Kénitra, Creation of LSP**





# LABORATORY OF SEPARATION PROCESSES

## ★ Researchers

- Permanent researchers : 01 in 1993 and 12 in 2009
- Students and non permanent researchers : 02 in 1992 and 26 in 2009

	Team	Responsible	permanent Members
Team 1	Membrane Separation Processes	Mohamed Taky	Zakia Amor Fatima Elhannouni Mohamed Taky
Team 2	Chemical Physic of Polyphasic Systems	Mahacine Elamrani	Fathallah Tiyal Azzeddine Elmidaoui Mahacine Elamrani
Team 3	Environment and Applied Chemistry	Abelaziz Ramadane Kribii	Abderrahim Kribii Omar Benali Abelaziz Ramadane Kribii
Team 4	Analytical and Organic Chemistry for the environment	Khadija Chlihi	Khadija Chlihi Soumeya Ejjiyar Hassan Oudda



# LABORATORY OF SEPARATION PROCESSES



## MAJOR FIELDS Of INTERVENTION:

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- **Environment**
- **Desalination**
- **Water and wastewater treatment.**
- **Treatment of industrial effluents (liquid waste).**
- **Recovery and valorisation of the raw materials**
- **Polymer Synthesis, Synthesis of Membranes**
- **Membrane processes**
- **Electrochemistry**
- **Biotechnology**
- **Hydrometallurgy**
- **Galvanoplasty .....**



# LABORATORY OF SEPARATION PROCESSES



## Research Topics developed (at the L.P.S) these five last years (2002-2008).

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- **Valorisation of Lactoserum and reduction of organic pollutants (ONA)**
- **Wastewater treatment by coupling conventional processes and unconventional processes (OCP).**
- **Fluoride removal in ground water by Reverse Osmosis, Nanofiltration, Electrodialysis (ONEP).**
- **Nitrate removal in ground waters by Nanofiltration and Electrodialysis (ONEP).**
- **Desalination of sea and brackish waters (OCP).**
- **Reduction of the melassigenic ions in canes juices by Nanofiltration and Electrodialysis (SURAC).**
- **Regeneration of the acids and the bases starting from salts by electrodialysis with bipolar membranes (OCP).**



## Research Strategy :

- **Research** : Applied, Academic and some times technologic
- **Partners** : National and International Industries, Associations, Universities (little), Others.
- **Choice of Teams** : national and regional concern
- **Base of Policy** : response to national priorities, respect of agreements and contracts, ensure interface between national and international industries, contribution to improve competition of national industries, **communication, development of large national and international human network.....**
- **Financing** : Industrial contracts and conventions (more easy to conduce), transfer of technologies, services (Wine..), official program (Avicennes, little, hard to conduce)



## **Research Topics developed (at the L.P.S) these five last years (2002-2008).**

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- **Demineralisation of beet solutions by Ion Exchange, Nanofiltration and Electrodialysis (SUNABEL)**
- **Characterization of the by-products of chlorination (THM) in the stations of water treatment (ONEP).**
- **Radiochemical Synthesis of the ion exchange membranes**
- **Physicochemical Characterization of the ion exchange membranes**
- **Recovery of heavy metals**
- **Purification of Phosphoric acid (OCP).**
- **Reduction of the volatile acidity in wine (TIA).**
- **Colloide Science: Solubilisation of some products in micelles, mixed micelles, vesicles and micro emulsions.**





# LABORATORY OF SEPARATION PROCESSES



**Research Topics developed (at the L.P.S)  
these five last years (2002-2008).**

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- **Preparation and Characterisation of meso/macro porous material for water treatment (CISC Spain, started in 2007)**
- **Corrosion and bio-corrosion - Inhibition of corrosion**
- **Electrochemical Pesticide reduction**
- **Adsorption and catalyse applied to the environment**
- **Structural study and valorisation of sedimentary organic matter.**
- **Organic synthesis and physico-chemical study of new specific molecules.**
- **Study of properties of solid-liquid interfaces**



# LABORATORY OF SEPARATION PROCESSES



## Research Topics to be started (at the L.P.S) in 2009

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- **Valorisation of Lactoserum (ONA, Centrale Laitière)**
- **Wastewater treatment by Membrane Bioreactor (BRM) (ONEP).**
- **Pretreatment MF, UF, NF in RO desalination process.**
- **Treatment of Margins by coupling conventional and unconventional processes (ONEP)**
- **Milk debacterisation by MF (ONA, Centrale Laitière).....**



# LABORATORY OF SEPARATION PROCESSES

## ☆ Partners

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**National** : ONEP, OCP, ONA (Centrale Laitière, Sugar Industries, SUNABEL; SURAC), Wine Industries...

**International** : Veolia (OTV, STI), Eurodia ( TOKUYAMA Corporation, Japan), TIA (France), VATACH-WABAG, EDS (Europe), IDI (USA), CFM (France), Pall Corp (UK)....

*Number of conventions and contracts these three last years: 10  
(400.000 EURO)*

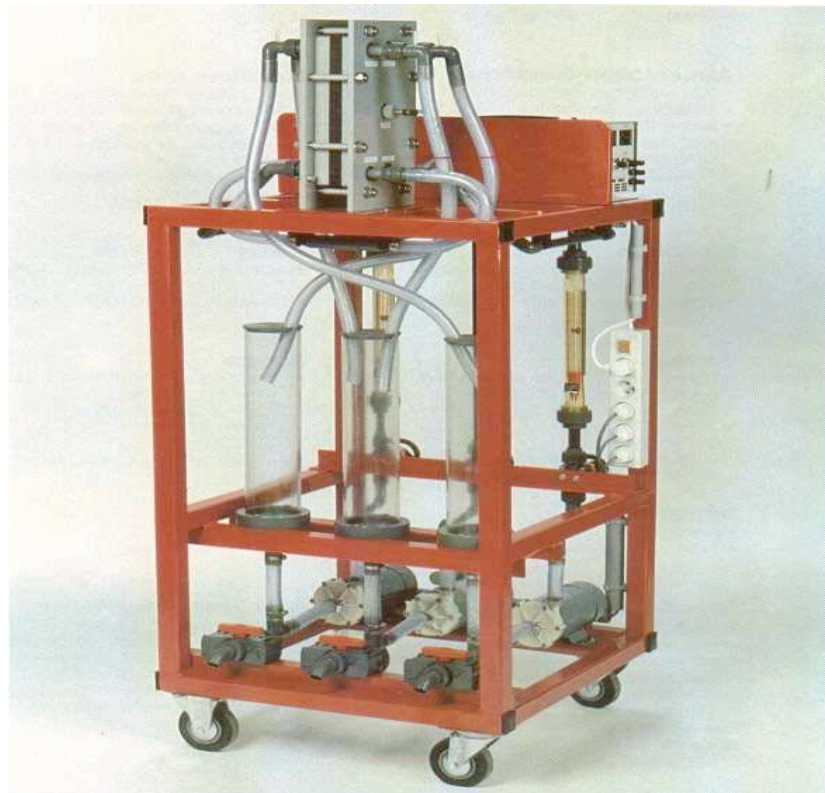


# LABORATORY OF SEPARATION PROCESSES



## ★ Materials and Pilot plants

- **Bioreactor.**
- **Laboratory Electrodialysis Plant.**





# LABORATORY OF SEPARATION PROCESSES



## ★ Materials and Pilot plants

### ➤ Industrial Electrodialysis Pilot Plant (1m<sup>3</sup>/h)





# LABORATORY OF SEPARATION PROCESSES



## ★ **Materials and Pilot plants**

- **Industrial Reverse Osmosis Pilot Plant**
- **Industrial Nanofiltration Pilot Plant**





# LABORATORY OF SEPARATION PROCESSES



## ★ **Materials and Pilot plants**

- **Industrial Ultrafiltration Pilot Plant**
- **Industrial Microfiltration Pilot Plant**

