Membrane operations at ECCE12 and ECAB5, 15th-19th September 2019, Florence (Italy)

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The 12th European Congress of Chemical Engineering (ECCE12) and the 5th European Congress of Applied Biotechnology (ECAB5) took place in the beautiful environment of Fortezza da Basso, Florence (Italy), from 15th to 19th September 2019. The common theme of the Congresses was "Bridging Science with Technology: a Renaissance in Science", covering many fields of interest for Chemical Engineering and Applied Biotechnology. In particular, 18 and 17 topics were treated by ECCE12 and ECAB5, respectively, as listed in Table 1. Moreover, three Symposia, a Workshop on Crystallisation and two project sessions were also organised.

Table 1. Topics treated by ECCE 12 and ECAB5

ECCE12	ECAB5
1. SUSTAINABLE PROCESSES	1. ADVANCED AND INNOVATIVE TECHNOLOGY IN INDUSTRIAL BIO-PRODUCTION, BIO-SEPARATION, AND BIO-DETECTION (BIOSENSORS)
2. PARTICLE TECHNOLOGY	2. BIOENERGY, BIOFUELS&RENEWABLES, BIORESOURCES, BIOREFINERY AND BIOMATERIALS (BIO-ACTIVE COMPOUNDS, BIOFUELS, FINE CHEMICALS)
3. PRODUCTION, PROPERTIES AND TECHNOLOGY OF NEW MATERIALS	3. BIOCATALYSIS (FUTURE MICROBES AND ENZYMES)
4. NANOTECHNOLOGY	4. NOVEL PROCESSING (E.G. MICROBIAL FUEL CELLS), DOWNSTREAM PROCESSING
5. SEPARATION TECHNOLOGY AND HEAT & MASS TRANSFER	5. FROM SMALL TO LARGE (NANO-BIOTECHNOLOGY, SCALEUP/ SCALE DOWN, LARGE-SCALE PRODUCTION)
6. THERMODYNAMICS AND INTERFACIAL PHENOMENA	6. SYSTEMS BIOTECHNOLOGY AND METABOLIC ENGINEERING
7. FLUID MECHANICS AND TRANSPORT PHENOMENA	7. PROTEIN AND ENZYME STABILITY
8. MULTIPHASE SYSTEMS	8. ENVIRONMENTAL BIOTECHNOLOGY
9. MEMBRANE ENGINEERING: Energy from salinity gradients, Hybrid artificial organs	9. BIOFILMS IN INDUSTRY AND BIOMEDICINE
10. INDUSTRIAL ELECTROCHEMISTRY	10. CHEMICAL PRODUCT DESIGN AND BIOPRODUCTS
11. PROCESS SYSTEM ENGINEERING	11. BIOECONOMY
12. CHEMICAL REACTION ENGINEERING	12. BIOREACTOR PERFORMANCE
13. BIOMASS	13. DOWNSTREAM PROCESSING
14. FOOD ENGINEERING	14. FOOD BIOPROCESSES
15. ENERGY AND CHEMICAL ENGINEERING	15. MICROALGAE BIOENGENEERING
16. ENVIRONMENT, SAFETY & QUALITY	16. MODELLING, MONITORING, MEASUREMENT & CONTROL
17. QUALITY ASSURANCE, CONTROL & MANAGEMENT SYSTEMS	17. REGENERATIVE MEDICINE MANUFACTURING
18. KNOWLEDGE, EDUCATION & TRAINING	

In this scenario, membrane operations were well represented among the different topics, with both oral and poster contributions, covering the 12% of the total presentations. More in details, 105 and 22 contributions were submitted to ECCE12 and ECAB5, respectively. Figure 1 shows the distribution among ECCE12 topics of the presentations (both oral and poster) dealing with membranes. It also includes those under ECAB5. It is interesting to notice that the highest number of contributions (35) was under the "Separation technology and heat & mass transfer" topic, followed by "Membrane engineering" (28), the remaining 42 presentations being spread among

other topics. Overall, membranes covered almost all the topics, confirming their important role in both Chemical Engineering and Applied Biotechnology research and development.

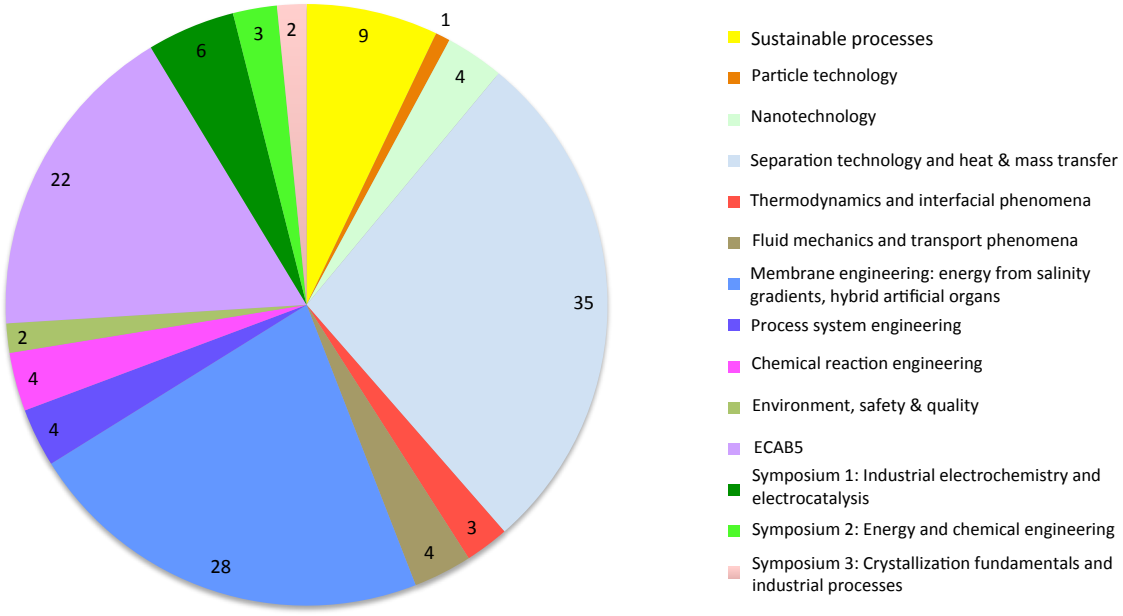

Figure 1. Distribution among topics of presentations dealing with membranes.

An indication of the increasing interest in membrane operations was the organisation of a specific session on Membrane Engineering, that took place over three days and included 14 oral presentations. Worthy to mention is also the plenary lecture given by Prof. Ortiz (Spain), completely focused on membrane processes.

In this context, the Institute on Membrane Technology (ITM-CNR) actively contributed to the dissemination of the potentialities of membrane operations in the topics: “Sustainable Processes”, “Separation Technology and Heat & Mass Transfer”, “Membrane Engineering: energy from salinity gradients, hybrid artificial organs”, “Thermodynamics and interfacial phenomena”, “ECAB5: Extraction & Crystallization” and “Symposium 3: Crystallization fundamentals and industrial processes”.