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Editorial

Asymmetric Membranes

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Nowadays, membranes are key components in various relevant fields. In fact, their application is gradually increasing from traditional fields, such as water desalination and purification and food processing, to applications in oil and petrochemical, biopharmaceutical, power, and energy-related industries.

Asymmetric membranes consist of a number of layers, each with different structures and permeabilities, and can be considered hierarchically structured systems where well and purposefully layers are designed to overcome transport limitations.

The present Special Issue of *Symmetry*, titled "Asymmetric membranes," features 11 articles about membranes of different materials for different applications, with asymmetry as the unifying theme.

The commentary by Buonomenna [1] emphasizes the need for research projects focusing on membrane materials that can be used at the end of the various research steps as membrane modules in real operation conditions, i.e., high pressures, high temperatures, and mixed feed components. Even though the investigation of new materials for membranes is amazing, often a careful characterization of known membrane materials that can be easily used to fabricate membrane modules on a large (industrial) scale, not only at a lab scale, should be encouraged and pursued.

Thus, in this context, the contributions by Sapalidis on polyvinyl alcohol membranes [2], Duolikun et al. on asymmetric cellulose membranes [3], Pulyalina et al. on polyimide-based membranes [4,5], and Boussemghoune et al. on ceramic membranes [6] are in line with the investigation of "old membrane materials," whilst the two papers by Nagandran et al. [7] and Goh et al. [8] focus on the enhancement of polymeric membrane performance by their modification by macromolecules and nanofillers, respectively.

Last but not least, three contributions of this Special Issue focus on some possible applications of asymmetric membranes. Huang et al. [9] address the issue of the control of membrane fouling in direct contact membrane distillation operation; Dizge and co-workers report the preparation of a zirconia-based ceramic membrane and its use for drinking water treatment [6]; Mousavi et al. [10] provide an overview of asymmetric membranes as potential scaffolds for wound healing applications.

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