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Editorial

Separation processes and technologies as the mainstay in chemical, biochemical, petroleum and environmental engineering: A special issue

Over the years, the chemical industry and its allied process industries such as food, agro, petroleum and petrochemicals, energy, environment, health, pharmaceuticals, resource extraction, processing and recovery, construction, cosmetics, waste management, etc. have demonstrated an evolutionary adaptation to the ever changing needs of their markets and consumers. As unit operations, innovative separation process and technologies have played a key role in the continual development of these industries. In addition to the extensively studied and implemented operations such as absorption and stripping, adsorption, distillation, crystallization, fluidization, solvent extraction, drying, etc., there has been considerable research and development in new thematic areas of separation science such as membrane and polymer science, nanotechnology, alternative fuels and bioenergy, process optimization, green engineering, etc. This is clearly reflected in this Special Issue (SI) of *Resource-Efficient Technologies*.

Similar to other industries, chemical and allied chemical industries have been significantly influenced by external macrotrends such as expansion of international trade and globalization [1], sustainability and the development of environmental consciousness, both in the consumer and the manufacturer [2]. In particular, this has seen the application of conventional and advanced separation technologies in the recovery of metals [3,4], removal of hazardous chemicals from the environment [5,6], contaminant removal and water purification [7], production of biofuels [8], in realizing enhanced value from substances that were erstwhile classified as 'wastes' such as human excreta [9] and husbandry wastes [10] etc. Interestingly, in several applications such as wastewater treatment, separation technologies no longer play their conventional role of 'removing and isolating' substances; instead, in lieu of regulatory considerations as well as growing recognition of the possibility of achieving significant cost reduction and energy savings, they have started to play the role of 'resource recovery/recycling' processes. Furthermore, given the high costs usually attributed to separation and purification operations in process industries, the search for non-conventional, low-cost, low-risk alternatives has spurned academic research worldwide. Again, this is illustrated in the SI where an increasing number of submissions have been influenced by such developments in separation science.

The SI has been developed on the basis of papers submitted by authors who attended the following conference held at VIT University, India (http://www.vit.ac.in/) on October 20–21:

TECHNOSCAPE 2016: International Conference on Separation Technologies in Chemical, Biochemical, Petroleum and Environmental Engineering (http://www.technoscape2016.com/).

Further, all authors working on any aspect of separation sciences who wish to contribute towards the development of the SI are invited to submit their research to the journal. Selected manuscripts are being published online as open access articles provided by Tomsk Polytechnic University (http://tpu.ru/en) in *Resource-Efficient Technologies*.

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