Prospective trends in design and operations of chemical processes
Heuristics, intensification, and digitization

Kumar, Vimal; Atta, Arnab; Pant, Kamal K.; Stankiewicz, Andrzej

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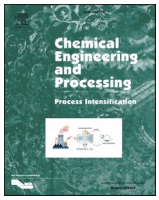

Editorial

Prospective trends in design and operations of chemical processes: Heuristics, intensification, and digitization

Festschrift issue in honor of Prof. K D P NIGAM at his 75th Birthday.

This special issue recognizes the former member of our Editorial Advisory Board, Professor K. D. P. Nigam, and his pioneering contributions to the area of process intensification, which include the understanding, analysis, and design of multiphase reactors, heat exchangers, computational fluid dynamics (CFD), and development of green technology for metal extraction from spent catalyst.

Prof. K. D. P. Nigam has distinguished himself in the field of Chemical Engineering and has been an integral part of Chemical Engineering Department at IIT Delhi. Having served in the Department since 1976, as full Professor since 1990 and as HOD in 1999–2002 and had distinction of being the only Professor in Higher academic grade (HAG) since 2009 till his superannuation in December 2011. He has overseen significant growth in research funding, research publications, and the number of doctoral students in the graduate program. He played a key role in establishing the presence of IIT Delhi in chemical reaction engineering at the world scenario.

Prof. Nigam's research in complex flow has resulted in several innovative devices that are practical to implement. Amongst many of his achievements, significant ones are his development of a novel reactor configuration for the countercurrent operation of a trickle-bed reactor, used in refining industry. Another innovative device, that has become a "signature" of Prof. Nigam and is very well-known within the process intensification community, is the so-called Coiled Flow Inverter (CFI). The research on CFI has brought Prof. Nigam not only tens of research papers in leading journals but also resulted in several industrial-scale applications.

Prof. Nigam has published widely - his scientific output so far includes more than 200 original research publications. He has served on the editorial boards of several international journals. He is also a gifted and dedicated teacher. He has supervised 25 doctoral and 65 master's students, and currently he is co-guiding few more Ph.D. projects at IIT Delhi. Even though he spent his entire academic career at IIT Delhi, he has also been involved after superannuation in mentoring students via visiting faculty appointments at several international institutes, such as Technology De Monterrey, Monterrey, Mexico, Chinese Academy of Sciences (IPE Beijing, China), University of Magdeburg (Germany), University of Adelaide (Australia), and Max Plank Institute Magdeburg (Germany). Prof. Nigam has also made significant contributions to science and technology policy by participating in several government advisory panels. He has served as a member of Scientific Advisory Committee of Ministry of Petroleum & Natural Gas (Government of India), Honourable Council Member of the All-India Council of Technical Education, which is the highest decision-making body on technical education in India, Board of Directors for Engineers India Ltd. as well National Fertilizers Ltd. and many more.

In view of his dedicated efforts and still continue enjoying research and contributing to the development of knowledge, he has been bestowed with UDCT (now ICT) Distinguished Alumnus Award 2017, Elected Mexican Academy of Sciences (The Academia Mexicana de Ciencias (AMC), November 2018) and The Life Time Achievement Award from Alma mater (November 2019).

On behalf of the contributors to this Special Issue and the entire chemical engineering community we congratulate Professor K. D. P. Nigam – a pioneer and inspirational academic leader in the field of process intensification – on his 75th birthday.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Vimal Kumar[a,*], Arnab Atta[b], Kamal K. Pant[c], Andrzej Stankiewicz[d]

[a] *Department of Chemical Engineering, Indian Institute of Technology Roorkee, Uttarakhand 247667, India*

[b] *Department of Chemical Engineering, Indian Institute of Technology Kharagpur, India*

[c] *Department of Chemical Engineering, Indian Institute of Technology Delhi, India*

[d] *Process and Energy Department, TU Delft, the Netherlands*

[*] Corresponding author.
E-mail address: vimal.kumar@ch.iitr.ac.in (V. Kumar).

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