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Unifying Concepts in Catalysis

Vortragsankündigung

- im Rahmen des UniCat-Kolloquiums -

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Es spricht: **Prof. Dr. K. D. P. Nigam**
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Zeit: **Montag, 22. September 2008**
14:15 Uhr

Ort: **TU Berlin**
Franz-Fischer-Bau
Straße des 17. Juni 124
10623 Berlin
Raum TC 014

Thema: **Coiled Flow Inverter: A novel Device**

Abstract: Flatter Velocity profile and more uniform thermal environments are extremely desirous factors for improved performance in flow reactors and heat exchangers. One means of achieving it in laminar flow systems is to use mixers and flow inverters. In the present study a new device is introduced based on the flow inversion by changing the direction of centrifugal force in helically coiled tubes. The main mechanism generating the flow is the production of spatially chaotic path by changing the direction of flow using a 90° bend in helical coils. In helical flow a 90° shift in the direction of centrifugal force cause a complete flow inversion. The Residence Time Distribution (RTD) experiments were conducted over wide range of process parameters to study the mixing performance of the proposed device. Considerable narrowing of RTD was observed under both the conditions of significant and negligible molecular diffusion. It is interesting to mention that the first element of tracer comes out at 0.86 of mean residence time under diffusion free conditions and under significant molecular diffusion the value of Dispersion Coefficient is of the order of 0.001.

Based on the success of this Innovative device its performance as a heat exchanger was also tested on the Pilot plant scale. The results show that even at low Reynolds numbers, heat transfer is 25% higher while pressure drop is 5-6% as compared to coiled tubes. The new proposed device offers several interesting applications in Process industry.

Organisator: **Prof. Dr. Reinhard Schomäcker(TUB)**

Gäste sind herzlich willkommen!

Prof. Dr. Matthias Drieff
Sprecher des Exzellenz-Clusters UniCat