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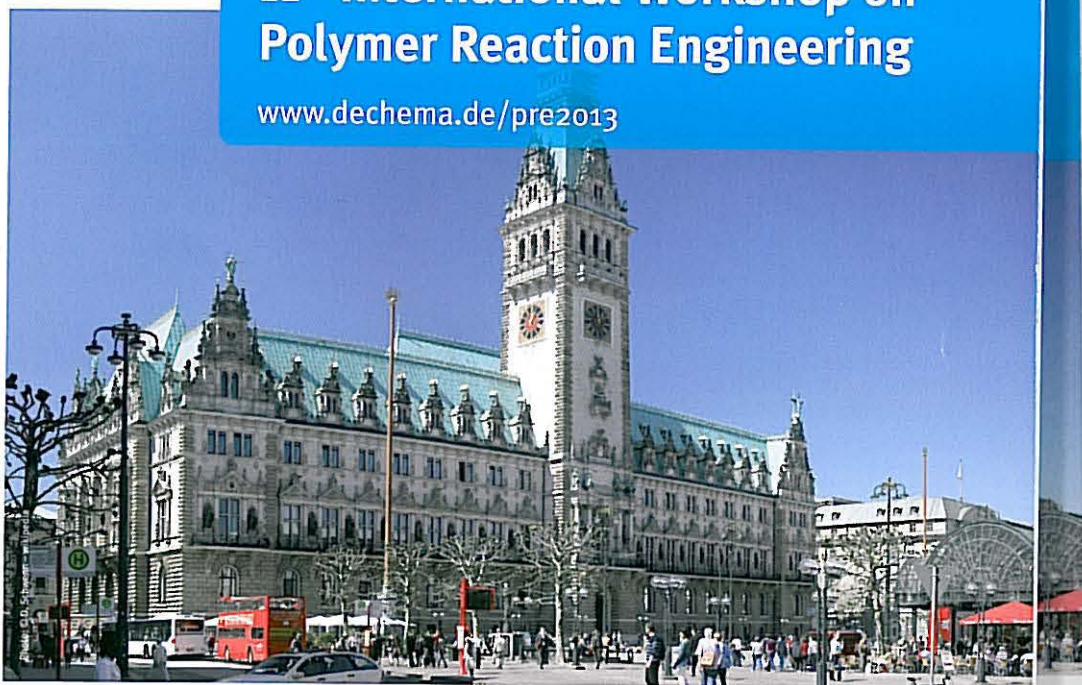
**PROGRAMME / BOOK OF ABSTRACTS**

May 21– 24, 2013

University of Hamburg / Germany

# 11<sup>th</sup> International Workshop on Polymer Reaction Engineering

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## Reactors for Reactions

amburg, Germany;

polymerization carried  
benefits such as a high  
feasibility of different

set-ups was solved by  
pressures for emulsion  
these PTFE-tubes.[2] It  
reactor types are not  
ainless steel tubes. In  
steel tubes will also be  
advantages of PTFE over  
the bendability (even if  
tubes easily enables  
phenomena.[3] Apart from  
possible. Therefore, the  
time distribution is  
placement.[4]

build-up is designed to  
single experiment without  
ties. For mass flows of  
reaction parameters  
map-reading method is  
temperature, conversion, or  
states. In addition it will  
between polytropic and

systems such as styrene  
instrumental analysis  
gravimetric analysis.

polymerisation," Universität

actor-Plants for Continuous

midt-Thümmes, W. Schmidt,  
UNG CHEMISCHER

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## Kinetic Studies on RAFT Inverse-Suspension Smart Hydrogels Formation using a Tetra Detector Array

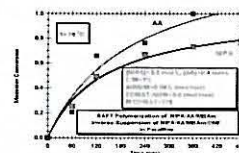
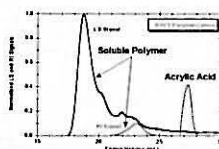
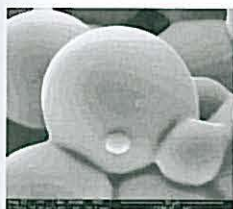
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*Mário Rui Costa<sup>2</sup>; Júlio Hemândes-Ortiz<sup>2</sup>*

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Temperature/pH stimuli-responsive hydrogel particles were synthesized using inverse-suspension polymerization in batch stirred reactor. Different water soluble co-monomers were present in the initial mixture (namely N-isopropylacrylamide and acrylic acid) as well as crosslinkers with different functionalities (bi-, tri- and tetrafunctional) so that their effect on the network crosslinking density could be seen. Different operating conditions such as polymerization temperature (in the range 20 to 70 °C), monomers dilution, neutralization and the initial ratios of co-monomers and monomers/crosslinker were also tried. Classical free-radical polymerization (FRP) and RAFT polymerization (e.g. using 4-cyano-4-phenylcarbonothioylthio-pentanoic acid) were compared in order to put into evidence the impact of the polymerization mechanism on the hydrogel molecular architecture. Sampling at different polymerization times allowed the study of the kinetics of gel formation through the analysis by SEC of the soluble phase. RI, LALLS, Intrinsic Viscosity and UV signals were simultaneously measured using a tetra-detector array, thus yielding absolute molecular weight, branching factors, hydrodynamic radius and radius of gyration. The performance of hydrogel beads was assessed through drug delivery tests triggered by changes in the environmental temperature/pH. Aiming at the development of tools hopefully useful for the design of such advanced materials, a general kinetic approach (*Chem. Eng. Sci.* 2005, 60, 423) was used to carry out modeling studies including consideration of finite loop formation reactions.



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