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Institut de Génie Chimique (IGC): Thermal Safety of Chemical Processes

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Today we understand runaway incidents and how to prevent them. The fact that such incidents still occur proves however that this knowledge, although available, is not thoroughly applied in chemical production. This is essentially due to the complexity of the phenomena and to the great diversity of the different tasks the production managers have to fulfill. The assessment of thermal risks involves very specialized knowledge which may not be accessible to everybody. Therefore, research and development in thermal process safety should provide production and development chemists and engineers with tools which are easy to use and facilitate the interpretation of data. Recent developments in the computer-aided tutorial science allow to develop original tools in the field of process safety.

An other aspect of the assessment of thermal risks offers a promising field for new developments: the experimental techniques often use short cuts to remain simple and practicable for most safety laboratories. The consequence is that greater safety margins are required to compensate the approximations. This may result in abandoning a process which could have been accepted if more accurate methods were used. This offers a further field for research and development in improving the experimental techniques and allowing to make more adequate recommendations for safety in chemical production.

Research Projects (examples):

- Accumulation of reactants in semi-batch reactors.
- Assessment of thermal risks in hydrogenation processes.
- Methodology for the assessment and prevention of runaway during melting operations involving reactive substances.



Francis Stoessel was born in 1952 in Mulhouse, France. He studied Chemistry at the 'Ecole Nationale Supérieure de Chimie', Mulhouse and earned his diploma degree in 1975 and his Ph.D. in Physical Chemistry at the University of Strasbourg in 1978. He joined *Ciba-Geigy*, Basel, in 1978 and worked in the Department of Physical Chemistry and Thermal Separation Processes. In 1986, he joined the Central Safety Research Laboratories of *Ciba-Geigy* and, in 1990, he became Head of the Central Safety Research Laboratories. Since 1992 he is responsible for the Thermal Safety Department. Since 1982 he is lecturer for Chemical Reaction Engineering at the 'Ecole Nationale Supérieure de Chimie' of Mulhouse. In 1996, he became associate Professor for Chemical Process Safety at the Swiss Federal Institute of Technology in Lausanne.

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