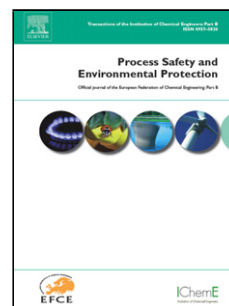


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Assessing Inherent Environmental, Health and Safety Hazards in Chemical Process Route Selection

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Abstract:

During early stages of plant design and development chemical process route selection needs to be carried out considering factors such as inherent safety, health and environment associated with the plant along with economic aspects. These factors need to be studied by looking at the worst possible impact that can result in from a catastrophic emission and also from daily operational conditions in the plant. This paper presents a methodology that can be used to select process routes during early design stages based on inherent safety, health and environmental friendliness considering impacts due to daily plant operational activities. An integrated index called Inherent Chemical Process Route Index (ICPRI) is proposed. The ICPRI considers the potential toxicological impacts on the environment and on the occupational health and the potential chemical and process safety impacts within the plant. A lower ICPRI value indicates a more inherently environmentally friendly, inherently occupationally healthy and inherently safer process route. The ICPRI is tested on four routes to produce acetone. The propene oxidation route showed the lowest ICPRI value indicating

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