

Box III Text of the abstract

The invention relates to the oligomerization of supercritical ethene. An essential aspect of the invention is that of mixing ethene with an inert medium and setting the conditions in the reaction such that both ethene and inert medium are supercritical. The solubility for ethene in the inert medium is greater in the supercritical state, such that more ethene is dissolved in the supercritical inert medium than in a liquid solvent. The process regime in the supercritical state therefore enables the use of a much higher proportion of ethene in a mixture of ethene and inert medium than is possible founded on the thermodynamic solubility restriction in a purely liquid hydrocarbon stream. In this way, the space-time yield is distinctly enhanced. Since a greater amount of ethene can be passed into the reactor, it is possible as a result to better exploit the apparatus volume compared to a liquid phase process. In addition, this invention relates to a process for regeneration of the heterogeneous catalyst. The catalyst is regenerated by purging with a liquid purging medium in absence of ethene, hydrogen and oxygen, and the oligomerisation and regeneration process is performed alternately over time.