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(54) Title: PROCESS FOR PRODUCING BENZENE FROM A C5-C12 HYDROCARBON MIXTURE

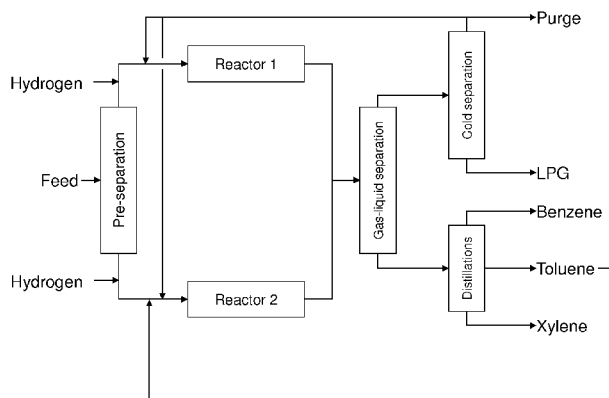


Fig. 1

(57) Abstract: The present invention relates to a process for producing benzene comprising the steps of: a) separating a source feedstream comprising C5-C12 hydrocarbons including benzene and alkylbenzenes into a first feedstream comprising a higher proportion of benzene than the source feedstream and a second feedstream comprising a lower proportion of benzene than the source feedstream and subsequently, b) contacting the first feedstream in the presence of hydrogen with a first hydrocracking catalyst comprising 0.01-1 wt-% hydrogenation metal in relation to the total catalyst weight and a zeolite having a pore size of 5-8 Å and a silica (SiO₂) to alumina (Al₂O₃) molar ratio of 5-200 under first process conditions to produce a first product stream comprising benzene, wherein the first process conditions include a temperature of 425-580 °C, a pressure of 300-5000 kPa gauge and a Weight Hourly Space Velocity of 0.1-15 h⁻¹, and c) contacting the second feedstream with hydrogen under second process conditions to produce a second product stream comprising benzene, wherein i) the second process conditions are suitable for hydrocracking and step (c) involves contacting the second feedstream in the presence of hydrogen with a second hydrocracking catalyst comprising 0.01-1 wt-% hydrogenation metal in relation to the total catalyst weight and a zeolite having a pore size of 5-8 Å and a silica (SiO₂) to alumina (Al₂O₃) molar ratio of 5-200 under the second process conditions which include a temperature of 300-600 °C, a pressure of 300-5000 kPa gauge and a Weight

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