

Separation of branched hexane isomers on zeolite BETA

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Tarragona, SPAIN, SEP 27-29, 2006 Abstract: An experimental study of the single, binary, ternary and quaternary fixed bed adsorption of hexane isomers onto zeolite BETA was performed covering the temperature range between 423 K and 523 K and partial pressures up to 0.3 bar. Adsorption equilibrium isotherms were collected from breakthrough experiments. Based on an analysis of sorption events at the molecular level, a Tri-Site Langmuir model (TSL) was developed to interpret the equilibrium data with good accuracy. At the partial pressures studied, it was found that the degree of branching was related to the affinity; the sorption hierarchy was most favourable towards the linear isomer and least favourable towards the di-branched ones. A mathematical model based on a linear driving force (LDF) was developed and used to test the experimental data. It was found that the model predicted the behaviour of the fixed bed experiments with good accuracy. Zeolite BETA demonstrated significant selectivity between branched C-6 isomers (especially at low coverage), thereby suggesting a means of solving this difficult separation problem. Document Type: Proceedings Paper Language: English KeyWords Plus: ADSORPTION; PELLETS Reprint Address: Rodrigues, AE (reprint author), Univ Porto, Fac Engr, Lab Separat & React Engr, Rua Dr Roberto Frias S-N, P-4100 Oporto, Portugal Addresses: 1. Univ Porto, Fac Engr, Lab Separat & React Engr, P-4100 Oporto, Portugal 2. Inst Politecn Braganca, Escola Super Tecnol & Gestao, P-5301857 Braganca, SP Portugal E-mail Addresses: arodrig@fe.up.pt Publisher: MULTI SCIENCE PUBL CO LTD, 5 WATES WAY, BRENTWOOD CM15 9TB, ESSEX, ENGLAND Subject Category: Chemistry, Applied; Chemistry, Physical; Engineering, Chemical IDS Number: 231ZO ISSN: 0263-6174