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**Hydrocarbon Isomerization and Phenol Oxidation using a Reverse Flow
Chromatographic Reactor**

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Abstract

A novel type of chemical reactor that simultaneously reacts and separates the products is being developed in our laboratory and is described below. Support provided by the Petroleum Research Fund is being used to benchmark a prototype reactor with a well-known model reaction of limited industrial application. PITA funds are requested to apply this reactor to the industrially important catalytic isomerization of n-alkanes to iso-alkanes. Isoalkanes are a key component of high-octane gasolines and are used in many petrochemical applications. A demonstration of the device value for this reaction will open the possibility of its use in many difficult and important isomerizations, such as orthoxylene to paraxylene. A new critical extension is the application to liquid systems where fast reactions are possible and reactor systems are far more compact than gas phase reactors. It is proposed that the environmentally-benign oxidation of phenol to quinones using an acid catalyst such as a zeolite and hydrogen peroxide as an oxidant be used as an example for this application.