In general, conversion of light paraffins and light olefins to more valuable cuts is very lucrative to the refining industries. This has been accomplished by alkylation of paraffins with olefins, and by polymerization of olefins. One of the most widely used processes in this field is the alkylation of isobutane with C_3 to C_5 olefins to make gasoline cuts with high octane number using sulfuric and hydrofluoric acids. This process has been used by refining industries since the 1940's. The process was driven by the increasing demand for high quality and clean burning high-octane gasoline.

Alkylate gasoline is a high quality and efficient burning gasoline that constitutes about 14% of the gasoline pool. Alkylate gasoline is typically produced by alkylating refineries isobutane with low-end olefins (mainly butenes). Currently, alkylates are produced by using HF and H_2SO_4 as catalysts. Although these catalysts have been successfully used to economically produce the best quality alkylates, the need for safer and more environmentally friendly catalysts systems has become an issue to the industries involved.

SUMMARY OF THE ~~INVENTION~~DISCLOSURE

The present ~~invention~~disclosure relates to methods for reducing organic halide concentration in hydrocarbon products having an organic halide content from 50 to 4000 ppm which are made by hydrocarbon conversion processes using halogen-containing acidic ionic liquid catalysts. The methods comprise contacting at least a portion of the hydrocarbon product with a molecular sieve having pore sizes from 4 to 16 Angstrom under organic halide absorption conditions to reduce the halogen concentration in the hydrocarbon products to less than 40 ppm.

In accordance with a first aspect, there is provided an alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 6 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 4 to 6 carbon atoms with a halogen-containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate

gasoline having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate gasoline with at least one molecular sieve having a pore size from 4 to 16 Angstrom under organic halide absorption conditions, whereby the organic halide is absorbed during the contacting to reduce the organic halide content by 97.1% or greater in the alkylate gasoline to an amount less than 40 ppm.

In accordance with a second aspect, there is provided an alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 5 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 4 to 6 carbon atoms with a halogen- containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate with at least one molecular sieve having a pore size from 4 to 16 Angstrom under organic halide absorption conditions to reduce the organic halide content in the alkylate by 97.1% or greater to produce an alkylate hydrocarbon product with an organic chloride content less than 40 ppm; whereby the organic halide is absorbed during the contacting of the at least the portion of the alkylate with at least one molecular sieve and the alkylate hydrocarbon product is not degraded during the contacting.

In accordance with a third aspect, there is provided an alkylation process comprising contacting a first hydrocarbon feed comprising at least one olefin having from 2 to 6 carbon atoms and a second hydrocarbon feed comprising at least one isoparaffin having from 4 to 6 carbon atoms with a halogen-containing acidic ionic liquid catalyst under alkylation conditions to produce an alkylate having an organic halide content from 50 to 4000 ppm and contacting at least a portion of the alkylate with at least one molecular sieve under organic halide absorption conditions to reduce the organic halide content by 97.1% or greater to produce an alkylate gasoline with an organic chloride content less than 40 ppm; and wherein the alkylate gasoline is not degraded during the contacting of the at least the portion of the alkylate with the at least one molecular sieve.