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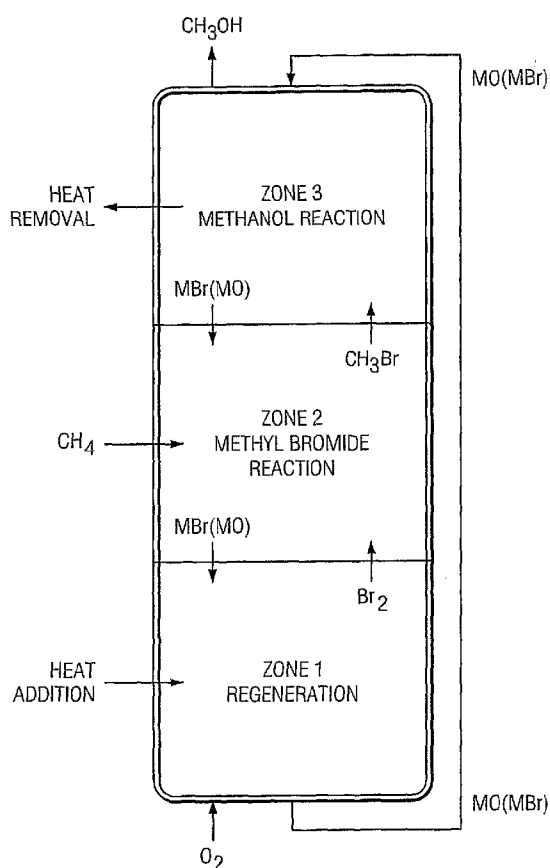
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(54) Title: ZONE REACTOR



(57) Abstract: In a method of converting alkanes to their corresponding alcohols, ethers, olefins, and other hydrocarbons, a vessel comprises a hollow, unsegregated interior defined first, second, and third zones. In a first embodiment of the invention oxygen reacts with metal halide in the first zone to provide gaseous halide; halide reacts with the alkane in the second zone to form alkyl halide; and the alkyl halide reacts with metal oxide in the third zone to form a hydrocarbon corresponding to the original alkane. Metal halide from the third zone is transported through the vessel to the first zone and metal oxide from the first zone is recycled to the third zone. A second embodiment of the invention differs from the first embodiment in that metal oxide is transported through the vessel from the first zone to the third zone and metal halide is recycled from the third zone to the first zone. In a third embodiment of the invention the flow of gases through the vessel is reversed to convert the metal oxide back to metal halide and to convert the metal halide back to the metal oxide.



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