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(54) Title: PROCESS FOR SELECTIVELY SEPARATING HYDROGEN, OR BOTH HYDROGEN AND CARBON MONOXIDE FROM OLEFINIC HYDROCARBONS

(57) Abstract

A process for the separation, and removal, of hydrogen, or both hydrogen and carbon monoxide, from a mixture of these gases with olefinic hydrocarbons. In one embodiment, a mixture constituted of hydrogen and one or more reactive unsaturated hydrocarbons is contacted with oxygen or an oxygen–containing gas, over a catalyst at reaction conditions sufficient to oxidize the hydrogen component of the mixture to form water, while suppressing reaction of the reactive unsaturated hydrocarbon. In a second embodiment, there is included a two–reaction–zone series wherein effluent from the first reaction zone, wherein the mixture includes hydrogen, carbon monoxide and at least one reactive unsaturated hydrocarbon, is contacted with oxygen or an oxygen–containing gas, and reacted over an oxidation catalyst at conditions sufficient to oxidize the carbon monoxide component of the mixture to form carbon dioxide and suppress hydrogenation of the reactive unsaturated hydrocarbons. In a third embodiment, there is included a three–reaction–zone series wherein effluent from the second reaction zone, wherein the mixture includes carbon monoxide, water, and at least one reactive unsaturated hydrocarbon, is reacted over a water–gas–shift and hydrogenation catalyst at conditions sufficient to react carbon monoxide component of the mixture to form carbon dioxide and hydrogen, and hydrogenate said reactive unsaturated hydrocarbon with the resulting hydrogen. In each embodiment, reactive unsaturated hydrocarbons denuded of hydrogen, or both hydrogen and carbon monoxide are recovered.