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PROCESS FOR REMOVING OXYGEN OUT OF INDUSTRIAL GAS-MIXTURES

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In industrial gases the presence of oxygen causes difficulties mainly if these gas-mixtures contain ingredients easily reacting with oxygen as for instance oxydable olefins and similar chemical compounds. Mainly at the gas storing under atmospheric or high compressed conditions these gas-mixtures may suffer an essential diminution of their value. Numerous propositions therefore are made for removing the undesired resting content of oxygen out of industrial gases by means of compounds which easily react with oxygen. For this purpose a treating with red phosphor is known. This manipulation involves however the danger that the gas mixtures are infected by pieces of phosphor. Furthermore the rest of oxygen may be removed by treating the gas-mixtures with catalytic substances at elevated temperatures. For this purpose temperatures are used, which generally depass the limit of 300° C.

Applicant had found that the whole oxygen out of industrial gas-mixtures may be removed completely at reduced temperatures by treating these gas-mixtures with finely divided metals of the eight group of the periodic system of elements. With highly activated catalysts of this manner the oxygen may be kept away already at temperatures below 200° C especially between 150–200° C.

A very high activity of the used catalysts may be caused by an addition of oxydes of the second or third group of the periodic system of elements (metals of the alkaline earths or metals of the earth). Oxydes of magnesium or thorium have found especially useful. A very fine division of the catalytic metals may for instance be attained by joint precipitation of the carbonates, oxydes or hydroxides on carriers with great inner surface as for instance on diatomaceous earth (kieselgur). Fitted for this purpose is furthermore a joint precipitation of the compounds which are to be added for increasing the catalyst-activity.

For the preparation of catalysts with high activity highly refined solutions of the metals in question (for instance Co, Ni, Fe and other metals) are necessary. Copper is very pernicious and the percentage of this metal must remain below 0.1%.

The carriers also, as for instance diatomaceous earth (kieselgur) or carbonate of magnesium, which is especially fitted for the catalysts in question are to be used in a highly refined state. The precipitated metal oxy-compounds are reduced to metals by hydrogen at a temperature ranging for instance between 300° C and higher temperatures. It is advantageous to perform the reduction by using very high layers.

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