SUMMARY ~~OF THE INVENTION~~

The above objects are attained by a process for the hydrogenation of at least one unsaturated hydrocarbon compound using a hydrogenation catalyst comprising an ordered intermetallic compound, which is an ordered cobalt-aluminum intermetallic compound or an ordered iron-aluminum intermetallic compound.

In a first aspect, there is provided a process for the hydrogenation of at least one unsaturated hydrocarbon compound selected from the group consisting of alkadienes, alkatrienes and alkapolyenes; alkynes, dialkynes, trialkynes and polyalkynes; and aromatic compounds, using a hydrogenation catalyst comprising an ordered intermetallic compound characterized in that the ordered intermetallic compound is selected from the group consisting of Fe_4Al_{13}, o-Co_4Al_{13}, h-Co_4Al_{13} and m-Co_4Al_{13}.

In a second aspect, there is provided a supported catalyst comprising a support and at least one ordered intermetallic compound supported thereon, wherein the intermetallic compound is selected from the group consisting of Fe_4Al_{13}, o-Co_4Al_{13}, h-Co_4Al_{13} and m-Co_4Al_{13}.

According to another embodiment~~aspect~~, the present disclosure~~invention~~ is concerned with a supported catalyst comprising a support and at least one ordered intermetallic compound supported thereon, which intermetallic compound is selected from the group consisting of CoAl, $CoAl_3$, Co_2Al_5, Co_2Al_9, o-Co_4Al_{13}, h-Co_4Al_{13}, m-Co_4Al_{13}, FeAl, $FeAl_2$, Fe_3Al, Fe_2Al_5 and Fe_4Al_{13}. In this specification, "o-Co_4Al_{13}" means orthorhombic Co_4Al_{13}, "h-Co_4Al_{13}" means hexagonal Co_4Al_{13}, and "m-Co_4Al_{13}" denotes monoclinic Co_4Al_{13}.

According to still another aspect, there is provided a use of an ordered intermetallic compound as a hydrogenation catalyst, wherein the ordered intermetallic compound is selected from the group consisting of Fe_4Al_{13}, o-Co_4Al_{13}, h-Co_4Al_{13} and m-Co_4Al_{13}. In another embodiment, the present disclosure~~invention~~ relates to the use of an ordered intermetallic compound, which is $CoAl_3$, Co_2Al_5, o-Co_4Al_{13}, h-Co_4Al_{13}, m-Co_4Al_{13}, $FeAl_2$ or Fe_4Al_{13} as a catalyst.

Preferred embodiments of the present disclosure~~invention~~ are subject of the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows the conversion and selectivity of Fe_4Al_{13} (158 mg) in the hydrogenation of acetylene in admixture with an excess of ethylene at 473 K.

Fig. 2 shows the conversion and selectivity of o-Co_4Al_{13} (150 mg) in the hydrogenation of acetylene in admixture with an excess of ethylene at 473 K.