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METHOD OF PRODUCING FINELY-DIVIDED NICKEL.

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This invention relates to a method of preparing catalytic or finely divided material.

The principal object of the invention is the production of metallic nickel in a catalytic state such as may be used in the hydrogenation of oils, fats, waxes and the like.

To this end the invention contemplates the alloying of metallic nickel with metals such as silicon and aluminum in various proportions, and then dissolving the aluminum and silicon from the alloy by means of a solvent which will not attack the nickel, whereupon the nickel remains in a finely divided state.

In this condition the nickel may be extremely catalytic, these properties apparently being intensified by the treatment.

The steps pursued in the treatment of the nickel are as follows:—

The proper proportions of nickel, aluminum and silicon are either melted separately, or together, and if the former, poured together in a suitable vessel. If this procedure is to be used, great care should be exercised, as the alloy is formed in an exothermic reaction.

The melt may be made in a graphite crucible in any desired type of furnace or fire, care being used to prevent contamination of the melt by impurities from the fire.

After the melt has fused and been thoroughly commingled, it is allowed to cool and is then pulverized in any desired apparatus.

In its ground form it is then subjected to the action of a solvent such as caustic soda, or the like, which will dissolve all of the alloyed material with the exception of the nickel. After this treatment the subnatent fluid is decanted and the residue, consisting of finely divided nickel thoroughly washed.

The nickel thus produced is ready for use as a catalyzer.

I have found that catalytic nickel may be produced in the above manner by alloying that metal with either aluminum or with the combination of silicon and aluminum, the operation for reaching the desired end being the same.

I have found a satisfactory proportion of the aluminum nickel alloy to be 50% aluminum and 50% nickel, and in the three-metal alloy, 50% nickel, 40% silicon, and 10% aluminum, although obviously I do not wish to be limited to the exact proportions, as the invention is not to be restricted to the proportions given.

The solvent may be of any desired strength, dependent upon the rapidity with which it is desired to remove the aluminum, or the aluminum and silicon. In the dissolving action a considerable amount of hydrogen is liberated, and this may be saved and used for other purposes, or not, as found convenient and expedient.

After having dissolved out the aluminum or the aluminum and silicon the resulting finely divided nickel may be dried at atmospheric temperature or in any other way exposed to the air, as a result of which the nickel does not have catalytic properties, but this substance is in this form suitable for many purposes.

I have gotten efficient results in the nickel and aluminum compound between the ranges of from 10% to 85% nickel, and from 90% to 15% aluminum respectively.

The aluminum nickel alloy possesses characteristics which are not possessed by an alloy containing these same substances and silicon. That is, the nickel aluminum alloy may be either very finely pulverized, say to 200 mesh, or it may be broken in pieces the size of peas or smaller. In either condition the alloy may be treated with caustic soda or the aluminum removed with the use of some other solvent. In case the larger pieces are used, the nickel is left in a more or less spongy and porous state, somewhat similar to a cinder, and for certain classes of work is is necessary and desirable to have the catalyzer in this condition. I find this characteristic peculiar to the aluminum nickel alloy.

Having thus described my invention, what I claim is:—

1. A method of preparing a catalytic material which includes the step of alloying the same with aluminum and dissolving the aluminum from the resultant alloy, whereby the catalytic material remains in finely divided condition.

2. A process of preparing a catalyzer which includes the step of alloying nickel and aluminum, and treating the alloy with a solvent which will dissolve the aluminum but not the nickel.

3. A process of preparing a catalyzer which includes the step of alloying nickel with aluminum and silicon, and dissolving

the aluminum and silicon from the resultant alloy.

4. A method of preparing a catalytic material which includes the step of alloying 50% nickel, 40% silicon, and 10% aluminum, and dissolving the silicon and aluminum from the resultant alloy.

5. A method of preparing finely divided nickel which includes the step of alloying nickel with aluminum and dissolving the aluminum from the resulting alloy with a solvent which will not dissolve the nickel and drying the resultant finely divided nickel.

6. A method of preparing finely divided nickel which includes the step of alloying nickel with aluminum and silicon dissolving the aluminum and silicon from the resultant alloy with a solvent which will not dissolve nickel and drying the finely divided product.

7. A method of preparing finely divided nickel which includes the step of alloying 50% nickel, 40% silicon and 10% aluminum and dissolving the silicon and aluminum from the resultant alloy and separating the finely divided nickel from the supernatant liquid.

In testimony whereof, I affix my signature.

MURRAY RANEY.