

≪1級課題-化学-≫

【解答にあたっての注意】

1. 問題の指示により和訳してください。
2. 解答語数に特に制限はありません。適切な個所で改行してください。
3. 課題文に段落番号がある場合、これを訳文に記載してください。
4. 課題は4題あります。それぞれの課題の指示に従い、4題すべて解答してください。

問1 ***START***から***END***までを和訳してください。

(注：<=は≦として扱ってください。)

START

Claim 1. A method for producing a soft magnetic alloy strip suited to be mechanically cut, having a chemical composition comprising, by weight:

18% <= Co <= 55%

0% <= V + W <= 3%

0% <= Cr <= 3%

and the rest consisting of iron and impurities from production, the said method comprising:

hot rolling a semi-finished product consisting of the alloy ; and

cold rolling the semi-finished product to obtain a cold-rolled strip with a thickness less than 0.6 mm,

wherein, after the cold rolling, the strip is running annealed by passing it through a continuous furnace at a temperature between the

order/disorder transition temperature of the alloy and the ferritic/austenitic transformation point of the alloy, followed by rapid cooling to a temperature below 200 deg.C.

Claim 2. A method for producing a magnetic component comprising: mechanically cutting a plurality of parts in a strip according to claim 1, and assembling the parts to form a magnetic component.

END

問2 ***START***から***END***までを和訳してください。

(注：HgCl₂中の数字は下付き文字として扱ってください。)

START

[0002] One of the current state-of-the-art process for manufacturing VCM (vinyl chloride monomer) is ethylene process using copper chloride as a catalyst. In an alternative process, ethyne (acetylene) from carbide is reacted with HCl over a mercury-based catalyst. This process is preferred where there is access to cheap ethyne via carbide from abundant coal resources. The mercury catalyst, usually 8-10% mercuric chloride on activated carbon, used in this process is highly toxic. Such toxicity creates problems arising from handling during manufacture of the catalyst as well as during loading of catalyst and removing catalyst after a campaign. A campaign is generally of six month duration. Deactivation of the mercury catalyst and loss of HgCl₂ by sublimation or volatilisation from the reactor in use can lead to significant problems. The ethyne process using a mercury-based catalyst requires a lower capital

investment in plant than the ethylene process. If a non-volatile and less toxic catalyst could replace the mercury catalyst without requiring significant plant alterations in existing plant devices, this would be a significant advantage.

END

問3 ***START***から***END***までを和訳してください。

START

The freeze-dried granular soluble coffee component of the instant dry mix particulate coffee beverage composition includes granules having a density of at least 0.3 g/cc and preferably from 0.3 to 0.45 g/cc. The freeze-dried granules are prepared by freeze-drying a coffee extract concentrate containing at least 55% coffee solids. Freeze drying may be carried out using equipment suitable for conventional freeze drying of coffee but under conditions which differ from conditions employed in conventional preparation of freeze-dried coffee, and which result in a dense product having an outer surface layer characterized by elongated voids extending generally perpendicularly to the surface of the granule and a larger inner core layer characterized by a glassy structure with a few large voids. This structure, which creates a "localized dissolution" of the coffee granules, is believed to be responsible for the marbled and non-uniform color effect which is characteristic of the surface foam of cappuccino beverages prepared from the present dry mix composition.

END

問4 ***START***から***END***までを和訳してください。

(注：Mg₂Ca、Mg₁₇Sr₂、Mg(OH)₂、(Mg,Ca)₃(PO₄)₂中の数字は下付き文字として扱ってください。)

START

In this study, Mg-based alloying system with Ca and Sr was investigated for its potential application as degradable orthopedic implant material. The alloys were mainly composed of three phases; alpha-Mg, Mg₂Ca and Mg₁₇Sr₂, which control the mechanical properties and the biocorrosion behavior. The alloys were found to have better mechanical properties than binary Mg-Ca alloys with similar amount of Ca additions. It was found that low amounts of alloying elements enhance the corrosion properties in Hanks' solution, with the optimal composition of Mg-1.0Ca-0.5Sr. At higher concentrations, the degradation rate increases possibly due to formation of higher amount of secondary phases. It was shown that Mg(OH)₂ and (Mg,Ca)₃(PO₄)₂ precipitated on the surface of the degrading material. Cytotoxicity tests on alloy components demonstrated that Mg-1.0Ca-0.5Sr resulted in almost negligible toxicity, and even the toxicity of Mg-0.5Ca-0.5Sr decreases with time. Collectively, the results conclude that the Mg-Ca-Sr system may be used for biodegradable orthopedic implant applications.

END