

★★★ <第26回知的財産翻訳検定試験【第14回和文英訳】> ★★★  
《 1 級課題 -化学- 》

【問 1】

2. A rare earth metal-transition metal alloy sputtering target according to Claim 1, wherein a variation of the area ratio of the pores is 0.4 or less, wherein the variation of the area ratio of the pores is defined by an expression  $(S_{\max} - S_{\min}) / (S_{\max} + S_{\min})$  under the condition that, when an area ratio of pores in the cross-sectional structure is measured at a plurality of places in a sample plane, the maximum value of the measured area ratio of the pores is  $S_{\max}$ , and the minimum value of the measured area ratio of the pores is  $S_{\min}$ .

【問 2】

Beer lees coal briquettes are carbonized products obtained by dehydrating and drying beer cake, heating and compression molding the cake in a suitable shape, such as a bar shape, then calcining the compression molded body at an appropriate temperature (usually 500 °C or more). In particular, when calcination is conducted at a high temperature of 600 °C or more, it is possible to obtain white coal with less powder generation having excellent hardness and degree of refining, such as Binchotan. In addition, beer lees coal briquettes have a higher ash content (especially P and Mg) and nitrogen content than ordinary charcoal, which is preferable when used as a soil conditioner. However, when the briquettes are immersed in water, some of the phosphorus contained at around 2% by weight elutes out, and this elution is highly likely to result in a violation of the Eutrophication Standards of the Environment Agency. Therefore, when the briquettes are used as a water purification material, it is necessary to prevent the elution of phosphorus.

【問 3】

The disintegrant composition according to the present invention is used as a modifier (also known as "disintegrant") for enhancing the disintegration properties of chemical products (e.g., tablets) that release their active ingredients as they disintegrate by absorbing water, such as orally disintegrating tablets and agrochemical granules. An orally disintegrating

tablet disintegrates in the mouth because a low-molecular-weight saccharide (e.g., D-mannitol) present as a binder in the disintegrating tablet dissolves in water in the mouth and loses its binding ability. The saccharide (B), which is one of the components of the disintegrant composition according to the present invention, is a highly hydrophilic compound that functions as a water-withdrawing agent to increase the rate of absorption of water into the disintegrant composition. Another component of the disintegrant composition according to the present invention, namely, the water-swelling polymer (A), swells quickly with water taken into the disintegrant composition by the action of the saccharide (B). The pressure resulting from volume expansion during swelling will cause the orally disintegrating tablet to disintegrate, thus providing superior disintegration properties.

#### 【問 4】

##### Example 1: Synthesis of Polymer Using Compound 1 as Chain Transfer Agent

Compound 1 purified in Synthesis Example I (125.5 mg (weighed to give a final concentration of Compound 1 of 0.5 M since this sample contained an extremely small amount of AIBN)), tBA (218.4 mg, 1.5 M), and the initiator 2,2'-azobis(isobutyronitrile) (AIBN) (13.14 mg (weighed to give a final amount of 0.16 equivalents per equivalent of Compound 1 by taking into account the weight of AIBN present as an impurity in Compound 1)) were placed in a polymerization tube and were dissolved in methanol to a total volume of 1 mL. The mixture was subjected to three cycles of freezing, degassing, and melting to create a vacuum in the polymerization tube, followed by sealing the polymerization tube. The polymerization tube was placed in an oil bath at 70 °C, and a polymerization reaction was performed for six hours to obtain a polymer. The results of electrospray ionization mass spectrometry (ESI-MS) of the resulting polymer are shown in FIG. 14. The polymer was also fractionated according to the number of monomer units with an automatic flash column purification system (Isolera One ISO-1SW from Biotage Japan Ltd.).