★★★ ＜第30回知的財産翻訳検定試験【第16回和文英訳】＞ ★★★
≪１級課題 -化学-≫

【問 1】
BACKGROUND OF THE INVENTION
Plastic products, particularly products of acrylic resins, polycarbonate resins, vinyl resins, etc., are poor in transparent surface hardness, abrasion resistance, chemical resistance, etc. To improve these properties, various methods for covering a plastic surface with a cured coating of organic silane materials have been proposed, thereby contributing to a certain level of effect being achieved. Covering resins having a refractive index of around 7.4 or more, such as styrene resins, phenoxy resins, polyester resins, or polycarbonate resins, with the cured coating as proposed is, however, disadvantageous in that slight differences in thickness of the cured coating from place to place are likely to cause interference fringes that significantly impair the appearance of covered plastic articles.
On the other hand, the proposed cured coating is excellent in surface hardness, abrasion resistance, weathering resistance, etc. but remains unsatisfactory in hot water resistance, alkali resistance, and other types of durability.
Japanese Patent Application Laid-Open No. 59-115361 discloses a composition containing a hydrolysate of an epoxy-containing silicon compound and an organic compound other than the epoxy-containing silicon compound, and inorganic fine particles having a diameter of not more than 200 millimicrons and a refractive index of not less than 7.6.

【問 2】
[0045]
Note that, in FIG. 1, organic gas introduction unit 121 is provided near the connection of reaction unit 13 and transporting unit 12, but the position thereof is not limited thereto. It can be provided at any position on or between vaporizing unit 11 and transporting unit 12. Further, for example, it can be introduced together with a carrier gas from carrier gas introduction unit 113. However, it is preferably located near the connection of reaction unit 13 and transporting unit 12. Thereby, it is possible to suppress a vaporized carbon-containing metal compound and an organic gas from

reacting with each other before they are introduced into reaction unit 13.

[0054]
In such a reaction system, an organic gas decomposes at a temperature lower than the normal pyrolysis temperature because the produced metal particles act as a catalyst for the pyrolysis reaction of the organic gas simultaneously with the production thereof. Thus, carbon is supplied from the thermally decomposed organic gas in this manner to form nanocarbon. As described above, since the organic gas thermally decomposes at a temperature lower than the normal pyrolysis temperature, from the viewpoint of preventing rapid pyrolysis and carbon supply and stably generating nanocarbon, the heating temperature is preferably lower than the pyrolysis temperature of the organic gas at normal pressure.

【問 3】
Specifically, the quartz glass plate was immersed in the sol liquid and pulled up from the liquid, and the coated plate was dried and then gradually heated from room temperature to 630°C, thereby firing the coating. This procedure was repeated seven times to form a 0.2 μm-thick titanium oxide film. The titanium oxide film thus obtained was examined for the crystal structure by X-ray diffractometry and, as a result, was found to have an anatase content of 100%. The titanium oxide thin-film photocatalyst was used to decompose tetrachloroethylene, which has posed a problem of ground water and soil contamination as a result of current widespread use thereof as a solvent and cleaning agent in high-technology industries and cleaning industries. A total of 18 ml of an aqueous tetrachloroethylene solution having a concentration of 100 ppm (0.01% by weight) was placed in a hard glass test tube, the titanium oxide thin-film photocatalyst was immersed in the solution, oxygen was bubbled into the solution, and the solution was then irradiated with light emitted from a 300 W xenon lamp for 1 hr 15 min. The resultant reaction solution was analyzed for the determination of tetrachloroethylene content by gas chromatography and, as a result, it was found that the tetrachloroethylene content was reduced by 95%. When the titanium oxide thin-film photocatalyst was not used, the content of tetrachloroethylene in the reaction solution was hardly reduced.

【問 4】

Claims

1. A method for separating and recovering valuable metals from battery waste, characterized in comprising:
   treating shredded and/or pulverized battery waste with an acidic solution to leach valuable metal ions,
   adding an alkali metal sulfate to an obtained leachate containing metal ions, then subjecting the leachate containing the alkali metal sulfate to coexist with a surfactant, thereby applying vibration to the leachate which results in precipitation of double-sulfate crystals, and
   performing solid-liquid separation of the precipitated double-sulfate crystals while applying vibration to the leachate.

2. The method for recovering valuable metals from battery waste according to claim 1, wherein the surfactant has, as a cation component, an ion of the same kind as an alkali metal ion derived from an alkali metal sulfate contained in the leachate.

3. The method for recovering valuable metals from battery waste according to claim 1 or 2, wherein the solid-liquid separation is performed while applying vibration using any one of a centrifuge, an ultrasonic vibrator, and a stirring blade.