★★★　＜第１１回知的財産翻訳検定試験【第５回英文和訳】＞　★★★

≪１級課題 -化学-≫

【解答にあたっての注意】

１．＊＊＊START＊＊＊から＊＊＊END＊＊＊までを和訳してください。

２．解答語数に特に制限はありません。

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３題あります。それぞれの課題の指示に従い、３題すべて解答してください。

〔問１〕次のクレーム（claims）を日本語に翻訳してください。なお、翻訳にあたってはクレームの後ろの明細書の記載（抜粋）を参考にしてください。

＊＊＊START＊＊＊

1. A composite article providing blast mitigation, the composite article comprising:

a fixed structure including a substrate, the fixed structure being subject to blast exposure, the fixed structure being selected from the group consisting of walls, floors, roofs, exterior ceilings, interior ceilings, dikes, dams, reservoirs, containment walls, Jersey barriers, barricades, bunkers, bridges, roadways, aqueducts, flumes, beams, columns, and piers; and

a polyurethane-polyurea layer bonded to the surface of the substrate and oriented in a direction of anticipated blast exposure to provide blast and fragment protection, the polyurethane-polyurea layer including a reaction product of (a) an isocyanate component comprising a toluene diisocyanate prepolymer having from 50% to 90% of a toluene diisocyanate, by weight of the toluene diisocyanate prepolymer, and a polyol having a functionality from 2 to 3 and being selected such that the toluene diisocyanate prepolymer has an NCO group content from 2.5% to 12%, and (b) an isocyanate-reactive component, the reaction product being the result of impingement mixing by plural component spray equipment using pressures between 2,000 psi and 3,000 psi and temperatures in the range of 145 degrees Fahrenheit to 190 degrees Fahrenheit, the polyurethane-polyurea having the following characteristics: a gel time between 5 and 9 seconds, a tack-free time between 10 and 16 seconds, and a tensile strength between 4,109 psi and 4,295 psi.

＊＊＊END＊＊＊

《参考》

TECHNICAL FIELD OF THE INVENTION

This invention relates, in general, to mitigation measures for explosive blast threats and, in particular, to a composite article having a substrate and a polyurethane-polyurea layer disposed thereon to provide blast and fragment protection from explosive devices.

BACKGROUND OF THE INVENTION

Mitigation measures for explosive blast threats are applicable to combat theater operations, potential civilian terrorist targets, and potential sites of accidental explosions.　Accordingly, blast mitigation measures are being utilized in military, government, business, and industrial applications to avoid casualties, reduce damage to infrastructure, and remain operational in the event of an explosion.

Existing mitigation measures for explosive threats include maximizing the stand-off distance between the target and potential explosives and hardening the target's envelope.　However, often it is not possible to maximize the stand-off distance. This is particularly true with respect to military applications, such as combat vehicles, and civil applications, such as buildings in urban settings.　Hence, there is a need for mitigation measures that harden a potential target's envelope and a greater need for such measures in instances where it is not possible to maximize the stand-off distance.

Example I

An A-side formulation is made by reacting 60% by weight of the A-side formulation of AIR PRODUCTS.RTM. TDI-based prepol, 23% by weight of the A-side formulation of MONDUR.RTM. ML MDI isomer mixture, and 17% by weight of the A-side formulation of

PPG-4000 prepolyol.　The ingredients are mixed vigorously at a speed that is short of forming a vortex.　A B-side resin is formed by mixing 70% by weight of the B-side formulation of JEFFAMINE.RTM. D-2000 polyoxypropylenediamine, 20% by weight of the

B-side formulation of ETHACURE.RTM. 100 curing agent, 7% by weight of the B-side formulation of JEFFAMINE.RTM. D-230 epoxy curing agent, and 3% by weight of the

B-side formulation of JEFFAMINE.RTM. T-5000 polyol.　The ingredients are stirred at ambient conditions until well mixed.　Optionally, a tertiary type amine catalyst may be utilized to increase the rate of the reaction.　The B-side resin is then complete.
The A-Side and the B-side are then processed through a GX-7 spray gun, which is manufactured by Gusmer Corporation (Lakewood, N.J.), and impinged into each other at
a 1:1 ratio at 2500 psi and 170.degree. F. (77.degree. C.).　The resulting polymer gels in approximately 10 seconds and is tack free in approximately 12 seconds.

〔問２〕次の米国特許明細書中の背景技術にかかわる記載内容について翻訳しなさい。

＊＊＊START＊＊＊
[0001] Another problem is caused by the heat loss due to vaporization of the fuel acting to cool an area to a temperature that is lower than the membrane and catalyst layers.　If the cooling is sufficient, then water generated by the fuel cell reaction at the MEA temperature may have a dew point that is higher than the temperature of the evaporation area of the fuel cell.　This can result in condensation of water at the evaporator surface in the anode chamber, thus leading to the problems discussed above regarding build up of water in the active area of the anode.
[0002] Furthermore, an uneven distribution of fuel to the active area of the fuel cell, can lead to "hot spots," which are locations on the membrane that have a much higher concentration of fuel than other places on the membrane.　These "hot spots" result in uneven reactions at the catalyst face, degradation of the membrane due to high temperatures, and uneven generation of water which can shut down the electrochemical reaction at the localized area.
＊＊＊END＊＊＊

〔問３〕次の米国特許明細書中の実施例にかかわる記載内容について翻訳しなさい。

＊＊＊START＊＊＊
[0003] In one embodiment of the present invention, the cemented carbide body is a cemented carbide cutting tool insert with a 10-25 µm, preferably 15-20 µm, thick binder phase enriched surface zone, essentially free from cubic carbide or carbonitride phases.　The surface zone has an average binder phase content 1.3-2.5 times higher than that of the inner portion of the insert.
[0004] The thickness and binder phase content of the surface zone is measured at a

distance about 0.5 mm from the edge line on the cemented carbide insert rake face. In addition, compared to cemented carbide inserts according to prior art, the structure contains less small WC-grains, the size of the gamma phase is increased and the gradient zone contains relatively large Co binder phase islands.

[0005] The average size of the Co binder phase islands in the binder phase enriched surface zone in cemented carbide inserts made according to the invention is 0.7-1.0 μm, the maximum size is 3-4 µm, measured on polished and Nital etched cemented carbide inserts in an optical microscope at a magnification of 1500x. Etching time is 15 minutes in a Nital etching reagent consisting of 10% solution of HCl in methanol. The hardness within the central parts of the cemented carbide insert, shall be >1500 HV3, preferably 1500-1700 HV3.

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