

Basic Study about Carbon Biomass Material for Compact Environment Monitoring Satellites

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The purpose of this study is to inspect possibility to adopt the carbon biomass material as the cases and also the antennas of the compact environment monitoring satellites. We made two kinds of the carbon biomass material of wood powder and a catalyst of Al₂O₃. The difference between two was the temperature to heat wood powder. We measured characteristics of electricity, strength and heat of them and five kinds of it. Ones of electricity were electric conductivity and electric shield characteristic. Ones of strength were Young rate and band strength. The others were the absorptance of the sunlight and the emittance of the heat. We compared them with characteristics of the aluminum and the CFRP (Carbon Fiber Reinforced Plastics) used frequently in space. Furthermore we supposed that we used this material for the satellites and considered three characteristics of them. They were the sensitivity of the antennas, the electric shield characteristic of them and the heat of it on condition that it was in space. Finally, we estimated this material to be cases of the satellites.

As a result of measurement, the material has enough electric conductivity and shield effect to use for the satellites. As for the heat, because it has high temperature in space due to high absorptance and low emittance, we need coat it with some material which has low absorptance and high emittance. But we do not have enough data to evaluate it as a material for the satellites. For example, concerning about its strength, we need strength for shock, for oscillation and the like. For that reason, it is the present condition that we can not come to a conclusion. For a future problem, we measure those characteristics and consider production parameters of the material to have better characteristics for the satellites.