

Sliding Friction in Seawater Environment of Porous Carbon Materials made from Rice Hull

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Rice hull, which is one of the agricultural wastes in Japan, is required to be reused from a viewpoint of recycling. The rice hull silica carbon (RHSC), made from rice hull is manufactured by mixing rice hull particles with a phenol resin, pressure forming, drying, and then carbonizing the mixture in the nitrogen gas environment at high temperatures. RHSC contains about 30 mass% of inorganic constituent and 70 mass% of organic constituent. The main inorganic constituent is silica (SiO₂), which content is more than 95 mass%. Silica has excellent corrosion resistance and oxidation resistance. Thus, it can be expected improvement of water resistance. In this study, focusing on the sliding friction and the water resistance, which are a core competence, the sliding friction was evaluated through wear amount and dynamic friction coefficient in air and pure water and seawater. The results showed that the dynamic friction coefficient of RHSC in each environment was low excellent value from 0.11 to 0.15. The wear amount in the air was about 50 μm in the 130 km running. By contrast, the wear amount in both pure water and seawater was reduced to 37 μm and 2 μm respectively. Thus, the use of RHSC can be expected in pure water and seawater.

Key Words : Rice hull, Renewable resources, Sliding friction, Seawater resistance