[C2]

Study on Properties comparison of Cu_2S and MoS_2 powders (1) – Lubricating properties in Oilless Bearing

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Metal Sulfides have been widely applied as lubricant and others. In the field of powder metallurgy, MnS is applied as machinability enhancement agents and MoS_2 as solid lubricant. MoS_2 is excellent lubricant but has been limited its application due to its high cost. Cu_2S was low price but has been limited its application due to its difficulty manufacturing with high purity.

Since metal sulfides with high purity can be recently manufactured in mass production, the possibility of its application was going to be evaluated in oilless bearing field, which is one of major consuming field of solid lubricant in P/M. Lubricating property of Cu_2S in oilless bearing was compared with that of MoS_2.

0~2 wt.% Cu_2S powder (5~10 ㎛) and 3 wt.% MoS_2 powder (1~3 ㎛) were added in the Bronze oilless bearing with Cu-10%Sn composition and then manufactured with cylindrical shape.

The properties after mixed, compacted, sintered as well as assembled were tested using XRD, SEM, EDX, Particle size analyzer (PSA), Rattler's tester, Oilless bearing performance tester etc.

According to the addition of solid lubricant, the green strength decreased. But sintering properties varied in accordance with kind of lubricant rather than its amount. Cu_2S addition showed the higher hardness than MoS_2 addition after sintering. And oilless bearing with 1.5% Cu_2S represented the same or more lubricating property than oilless bearing with 3% MoS_2. Test results of bearing temperature were similar.

Considering the above results, Cu_2S is assumed to be rapidly applied as the substitute of MoS_2 in PM.