Q Zou et al., J Material Sci Eng 2016, 5:4(Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.040

Effect of Ti_3SiC_2 on friction and wear properties of Cu alloy matrix composite

Q Zou, M Z Wang, J Q Zhang, J M Li and Y C Zhao
Yanshan University, P. R. China

Ti_3SiC_2-Cu alloy matrix composite (T-Cu) of brake pad was fabricated through partly replacing flake graphite in graphite-Cu alloy matrix composite (G-Cu) of brake pad with Ti_3SiC_2 particle as antifriction component. Friction and wear properties of T-Cu and G-Cu composites were measured in order to investigate the effect of Ti_3SiC_2 and obtain the effect differences of Ti3SiC2 and flake graphite on them. Friction coefficients of G-Cu and T-Cu decreased as applied loads increased from 100 N to 400 N within 900 s. Friction coefficients of T-Cu were 1.5-2 times as those of G-Cu in the same conditions. Friction coefficients of T-Cu increased slightly with measured time increase, while the G-Cu's was almost constant. T-Cu showed relatively stabler average friction coefficients than those of G-Cu from room temperature to 500° measured in the conditions of 200 N load, 1.2 m/s speed and within 900 s. Average wear rates of G-Cu and T-Cu decreased with applied load increase. Worn surfaces of T-Cu were smoother than those of G-Cu after being worn. Wear resistance of T-Cu was better than that of G-Cu. Ti_3SiC_2 had superior properties and distributed evenly in Cu alloy matrix. Interdiffusion of Ti_3SiC_2 and Cu alloy matrix enhanced their combination and prevented Ti_3SiC_2 fall off easily from Cu alloy matrix. Lubricant films were formed on T-Cu surfaces consisting of Ti and Si oxides, which effectively improved T-Cu oxidization resistance. Thus comprehensive properties of T-Cu were better than those of G-Cu.

Biography

Q Zou has completed her PhD from Kochi University of Technology. She has published more than 40 papers.

1465314@qq.com, zq@ysu.edu.cn

Notes: