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# Wear and friction behaviours of copper mesh and flaky graphite-modified carbon/carbon composite for sliding contact material under electric current

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## ABSTRACT:

To obtain a sliding contact strip material with good electrical conductivity and wear resistance, carbon fibre/copper fibre-reinforced carbon matrix composite ( $C_f/Cu_f-C$  composites) with and without flaky graphite were fabricated using a chemical vapor infiltrated process (CVI) and impregnation technique. The microstructure and mechanical and electrical properties of the composites, as well as those of a carbon composite used in contact strip of china high-speed railways in China, were investigated. The wear behavior of the three composites were investigated using a pin-on-disc-type wear tester with electrical current. The wear test was carried out under an AC electrical current of 50 A with a normal load of 70 N and sliding speeds ranging from 10 to 30 m/s. The results indicated that the  $C_f/Cu_f-C$  composite with flaky graphite had several advantages in mechanical and electrical properties. The carbon composite is more easily worn when the sliding speed was higher than 20 m/s. At a sliding speed of 30 m/s, the wear rate of the  $C_f/Cu_f-C$  composite with flaky graphite was 3.22 mg/km, which is only two-thirds that of the carbon composite.

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