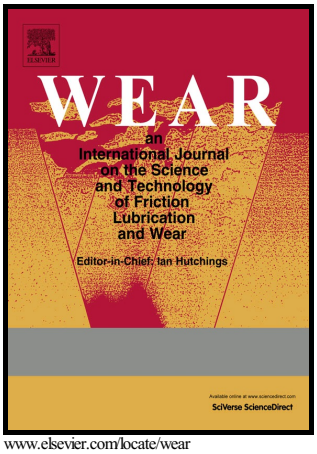

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Dry sliding behavior and friction layer formation in copper-free barite containing friction materials

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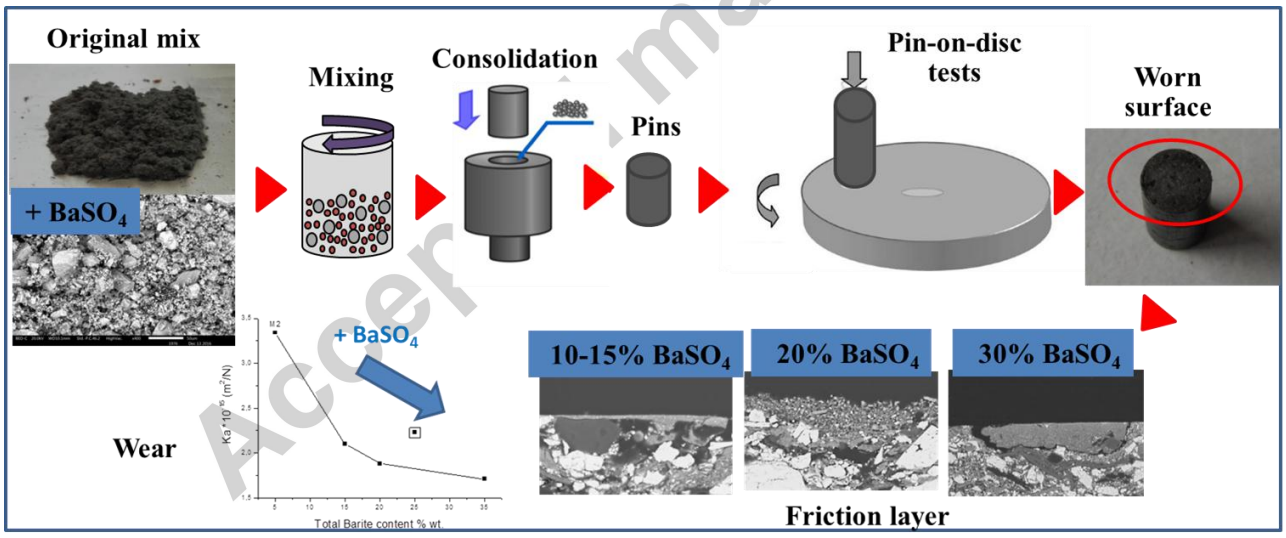
Abstract

The tribological behavior of materials used for vehicular car brakes is investigated using pin-on-disc tests. In particular, the disc was made of a commercial gray cast iron, used for real brake discs. The pins were made of newly developed formulations of friction materials, whose thread-line is the elimination of copper. This element was present in the selected bench-mark friction material, which is a low-metallic material, in which copper is replaced by re-arranging the overall composition and by adding increasing amounts of barite, up to a total maximum concentration of 33.5 wt.%. Wear products, namely the friction layers that formed on the mating surfaces of the pin materials, have been characterized to identify the main phenomena involved and influencing wear rate and friction coefficient. The main outcome of the research is the beneficial influence of barite, the compositional range that is important to target, the possible routes to be pursued, to improve the results achieved so far.

Graphical abstract



Keywords

Barite; copper-free friction material; friction layer; mechanically mixed layer

1. Introduction

Car industry is facing ever increasing challenges to render vehicles compliant with international standards and regulations on emissions [1-3]. Important research efforts are being concentrated on reducing or, even