It is important to note that one major purpose of the reconditioning agents is to retard the formation of forsterite (a mineral not originally present in the brake material, but created by dehydroxylation and recrystallization of chrysotile asbestos at high temperatures) which may accumulate on the surface of the brake lining. The hardness of the forsterite (Mohs, 6.5-7.0) is such that it tends to score and gouge brake linings (hardness 3-3.5), degrading them prematurely. Therefore, recrystallization of chrysotile to forsterite is an unwanted effect, hindered insofar as possible by the modifiers present in the matrix.

Materials of biological interest

Asbestos, quartz, and heavy metals are constituents of automotive brake linings, each warranting special consideration from the viewpoint of biological activity. The focus of this report is limited to the problem of chrysotile asbestos exposure.

Mechanisms of degradation of brake linings during use

Brake wear is dependent upon many factors, such as the temperature generated at the surface of the brake shoe during braking operations. At any one time, only a small percentage of the rubbing area is in contact with the wheel, with "hot spots" generated, ranging up to 800 to 1,000°C (Carroll, 1962; Anderson, 1969). It is not uncommon during moderate braking action, to attain temperatures as high as 500°C (Anderson, 1969). Some investigators have suggested that, in addition to binder pyrolysis, chrysotile completely dehydroxylates under these conditions and "reduces to powder" where it is swept off the brake facing (Carroll, 1962). However, this hypothesis is oversimplified, in that other important processes, besides thermal wear, contribute to shoe breakdown, and brake shoe degradation.