

OILS AND OTHER ORGANIC MATERIAL ASSOCIATED WITH ASBESTOS

Three types of asbestos are used industrially: crocidolite, amosite and chrysotile. The first two of these, but not the third, contain appreciable amounts of natural oils which may be removed to a large extent by extraction with suitable solvents.^{14,15} Crocidolite, amosite and chrysotile may also contain secondary oils as a result of the addition of oil to the asbestos during processing, or as a result of contamination. Asbestos is normally transported and stored in jute bags and the oil from the jute fibers is absorbed to an appreciable extent (70 to 80 per cent) by all three types of fiber. Jute bags are almost always used in the industry, from the point where the fiber leaves the mill to the point where the manufacturer uses it for his own purposes. In processing, rebagging may be done and there paper-lined bags or plastic may be used, the latter being costly.

An account of the natural (primary) and secondary oils which may be found in asbestos has been given by Harington elsewhere in this monograph.¹⁶

The Natural Oils

As reported elsewhere,¹⁶ it is not yet known whether there are any quantitative or qualitative differences between crocidolite and amosite oils, nor whether these oils vary in yield and composition from batch to batch, or within the same sample of fiber. On the other hand, there seems little doubt that finely-divided asbestos yields more oil than the longer fibers in milled material.

Large amounts of crocidolite and amosite oils (150 to 200 ml.) have been extracted from 45 kg. amounts of mixtures of both finely-divided and commercial fiber, using double-distilled petroleum ether. It is important to record that the solvent used for these extractions was of a high degree of purity. Ultra-violet and infra-red spectra indicated that it was apparently free of contaminating materials and no residue was detected when a two-liter sample was evaporated to dryness. The yields for both oils were approximately 0.8 per cent by weight of the crude asbestos fiber before extraction.

The two oils differed in color and in infra-red spectra, and more polycyclic hydrocarbons were detected in amosite than in crocidolite. A sample of the crocidolite oil was found to contain 1 µg. benzo[a]pyrene/100 g. fiber and the amosite, 5 µg. benzo[a]pyrene/100 g. fiber. Details of these analyses are given by Harington elsewhere in this Annual.¹⁶

The concentrations of benzo[a]pyrene and related polycyclic hydrocarbons are so low that it is difficult to believe that their presence plays more than a minor carcinogenic role, even in persons exposed most heavily to crocidolite or amosite dusts. The elution by serum of benzo[a]pyrene and such hydrocarbons from asbestos is probably equally insignificant.

In order extractable

(a) Tests

taneous

These tests at the alle- two species carcinogeni before extr in carcinog.

In contro suspension- (2) the fib with 8 diff

Tests, us

those using

died from

visible at t

asbestos fib

cytes. Othe

area contain

not detected

not been nec

BALB/C m

especially is

crocidolite,

between gr

have been n

however, th

(b) Tests

cer had

After the

had been re-

of lung can

tory in the l

tion a large

had been ex-

and biologic

In the blo

native amon

8000 1040