because of their color, while amosite is readily distinguished from the two other varieties through its low MgO content and high iron content. In contrast, it is not readily possible to determine whether anthophyllite or tremolite is present on the basis of the analytical findings alone since the values are often identical or overlapping, so that recourse must be taken in crystal-optical or roentgenographic determinations.

Asbestoses almost invariably contain "impurities," such as admixed minerals or stony materials present as intergrowths or as isomorphic compounds. The kind and quantity of the foreign materials differ in accord with the origin of the asbestoses; they are characteristic and fairly constant for a particular series of occurrences. Among the minerals that exhibit intergrowth with asbestoses, especially with chrysotiles, those of prime importance are: brucite, nemalite (fibrous brucite), calcite, dolomite, magnesite. As fixed constituents of the asbestos crystal structure they cannot be separated from the asbestoses by mechanical methods.

Isomorphic phenomena in asbestoses involve not merely a portion of the crystal lattice as is true of intergrowths but of certain ions themselves. For example, a part of the silicon of the asbestoses was almost always replaced by aluminum ions, and, depending on the variety of asbestos, more or less of the magnesium was replaced by Fe(II) or Fe(III) ions. In the case of crocidolite and also amosite, which may be regarded as ferro-anthophyllite asbestos, this substitution has proceeded so far that ferro- or ferroferri-silicates are actually present. The bright blue crocidolites of Bolivia and China can be viewed as transition stages.

The intergrowths and isomorphic replacements are in contrast to the physically admixed materials which cannot always be removed mechanically. They either enter the asbestoses only during the extraction and processing, or if present originally they cannot be removed from them. When considering these accompanying materials it is well to distinguish between those that are related to the asbestoses and those that are not. The former include serpentine, antigorite, asbestos dust, silicified or talcified fibers, riebeckite, gruenerite, tremolite, actinolite, anthophyllite, etc.; among the latter are: quartz, quartzite, "sand" magnetite, limonite, other iron oxides and minerals, talc, chlorite, chromite, alumina, serpentine, peridotite, amphibolite, calcite, brucite, magnesite, dolomite, picrite, picrolite, nickel and manganese minerals,

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cummingtonite, griqualandite, tiger-eye, cat's eye, palygorskite, pyrites, mica, sphene(titanite), gedrite, nontronite, acmite, diabase, dust of these rocks and minerals, etc. The size of the grain of the admixed materials, which for the most part adhere to the asbestoses as inclosing gangue or mineral, ranges from that of particles visible to the naked eye to finest dust.

A knowledge of the various "contaminants," whose nature can be understood above all from the conditions prevailing during the formation of the asbestos (see 2.1 and 2.2), is of great importance with regard to the processing of the asbestos and the use of the asbestos products, the undesirable content of magnetite being the most important with respect to the employment of the asbestos in the electrical engineering field. The iron oxides, which are invariably present in chrysotiles, where they are more or less firmly bound, and in whose analytical data they are reported as FeO and/or Fe_2O_3 (frequently also as simply R_2O_3) do not exert any electrical disturbing actions, whereas magnetite (Fe_3O_4), which is enveloped in granular form by the fibers and revealed only with difficulty by chemical analysis, is electrically conductive and also magnetic. For these reasons the chrysotiles with low magnetite content, which occur mostly only at certain usually serpentinized localities (dolomite and calcite, usually with diabase) are acquiring increased importance. The leading deposits of "low iron chrysotile" are in:

Arizona*: North of Globe
British Columbia: McDame in the Cassiar Mountains
Bechuanaland: Moshaneng mine (of the Marlime Chrysotile Asbestos Corp. Ltd.) near Lobatsi
India: Cuddapah
Transvaal: Carolina; also to some extent, Barberton
Morocco: N'Cob
China: Hupeh; in part also Sikang
Australia: various small deposits
California: Goldbelt Springs in Death Valley (Panamint Range, Inyo County)
Montana: Cliff Lake (Madison County)
New York: Thurman (Warren County)

The chrysotiles in these deposits occur almost exclusively as cross fibers, and after being broken up or opened they are pure

* The use of fibers from deposits in USA and test explorations in newly discovered deposits are controlled and financed through the DMEA (Defence Minerals Exploration Administration).