



From hazardous asbestos containing wastes (ACW) to new secondary raw material through a new sustainable inertization process: a multimethodological mineralogical study

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Nowadays, asbestos-containing wastes (ACW) still represent an important environmental problem and a severe health hazard due to the well known pulmonary diseases derived from asbestos fibres inhalation. Except for a very few cases, ACW are currently confined in controlled landfills, giving rise to increasingly high amounts of still hazardous wastes. A promising alternative to landfill confinement is represented by ACW inertization, but the high cost of the inertization processes so far proposed by the scientific community have hampered the creation of actually operative plants. In this paper, we explore the possibility to use an innovative process that ensures the obtainment of asbestos-free inert material in an exceptionally short processing time, thus greatly reducing cost-related problems. The efficacy of the inertization process has been verified through accurate mineralogical investigations on both chrysotile and crocidolite de-activated fibres, through X-ray diffraction, scanning and transmission electron microscopy. Overall mineralogical, microstructural and granulometric characteristics of the inert bulk material suggest that it could be successfully re-used as a secondary raw material in ceramic industries. This innovative inertization procedure could therefore provide an effective and economically sustainable solution for ACW management.