σ_{n-1}=0.232) for the babbros and 1.361 (std. dev., σ_{n-1}=0.225) for the peridotites. The total mean value is 1.177 with std. dev. σ_{n-1}=0.292.

Relationships between the abrasion loss of weight (AR, %) and properties such as dry density (d, gr/cc) and ultrasonic velocity (vp, m/msec) are determined, confirming the precision of the method. For sound rocks the existing relationships could be expressed by the following linear regressions:

a) AR=10.21-3.17d, r=0.826, b) AR=6.34-0.86vp, r=-0.806

Yet, in weatthered materials, especially in multiphase rocks, the rate of change of the abrasion loss of weight increases more quickly than the decrease of the dry density and the ultra sonic velocity. In case that tests cover a big range of values, from sound to weathered specimens, the existing relationships could be expressed better by the following exponential regressions:

a) $AR=6760.89e^{-3.05d}$, r=-0.870, b) $AR=175.38e^{-0.84vp}$, r=-0.806

The relationship between dry density and ultrasonic velocity is the following: vp= -3.40+3.30d, r=0.918.

KAOLINITE GENERATING PROCESSES IN THE MILOS BENTONITES AND THEIR INFLUENCE ON THE PHYSICAL PROPERTIES OF BENTONITES

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Kalonite and/or halloysite are present in almost every bentonite deposit of Milos and Kimolos. Although their genesis is well understood and has been attributed to the hydrothermal alteration observed on both islands, the nature of the relationship between smectite and kaolinite has remained rather obscure so far. The spetial distribution of these two different clay minerals does not follow a clear pattem, indicating that the genetic models proposed so far do not explain adequately their coexistence.

Both kaolinite and halloysite occur in the form of euhedral crystals (hexagonal, forming "books", in the case of kaolinite and acicular in the case of halloysite) which grow principally at the expense of smectite precursors. This relationship is observed in every deposit in which these phases are present, suggesting that the mechanism which led to their formations was different from that of smectite. The alteration of smectite to kaolinite might have taken place either by direct dissolution or during the conversion of smectite with high layer charge to smectite with low layer charge by release of Al. The latter mechanism might have been carried out either through solid state transformation or through neoformation processes. Kaolinite has also been formed as a by-product phase during illitization of smectite.

The aforementioned alteration of smectite caused by hydrothermal activity has affected adversely the physical properties of the original bentonites. It has been found that properties like quality, grade, and viscosity deteriorate with increasing degree of hydrothermal activity. Although increasing abundance of kaolinite is ususally associated with deterioration of bentonite quality its presence in small amounts may not be harmful. This is especially true for rheological properties like viscosity.

COLOUR AND RHEOLOGICAL PROPERTIES OF SOME WHITE BENTONITES FROM MILOS AND KIMOLOS ISLANDS

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White bentonites are special materials which are prized for their whiteness and brightness in addition to the known properties of smectite-rich clays. Such materials occur in the eastern sectors of both the islands of Milos and Kimolos. They have been derived from alteration of acidic pyroclastic rocks, mainly ignimbrites. Notwithstanding their similar geochemical affinities, the white bentonites of Kimolos are superior materials compared with their counterparts from Milos in both the colour and the rheological properties. The reason for the different colour properties is believed to be closely associated with the different mineralogical assemblages present in the rocks and the different mineral chemistry. The other factors affecting colour do not vary in the two areas.

The smectite present in Kimolos is the major Fe-bearing phase, and belongs to the Chambers (Cheto) - type. On the other hand, in the white bentonites of Milos the Smecitets are almost Fe-free (beindellites and Tatatilla-type montmorillonites). Consquently iron is concentrated in Fe-oxides producing red colourations and deteriorating the colour properties of these materials. Also the bentonites of Milos carry abundant opal C-T which adversely affects their possible ulitilization in industrial applications like cosmetic and pharmaceutical without prior beneficiation.

The rheological properties of the white bentonites are affected mainly by the existence of opal C-T rather than the pH and/or nautre of the exchangeable cations. It is believed that the presence of this phase, the size of which is smaller than 2μm, prevents smectite crystallites forming a rigid "card house" structure. Consequently they do not develop high yield stress and this results in lower viscosity. On the other hand,