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Comparison of IR Spectra of Five Porcelain Compositions Prepared Using Algerian Raw Materials

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Abstract : The interest in Infrared (IR) spectroscopy is an essential technique for the characterization of ceramic. Its main advantage when it comes to studying items is that it is nondestructive: the samples can be investigated without further preparation. IR spectroscopy probes molecular and crystal lattice vibrations and therefore is sensitive to the compositions, chemical environment, bonding and crystalline/amorphous structure of a sample material. Five Porcelain compositions were studied by non-destructive infrared Raman spectroscopy: kaolin was derived from Debagh deposit (Guelma region), Quartz was derived from El Oued region and PF was derived from Ain Barbar deposit (Annaba region) and both commercial Alumina talc. Raman intensity is a very powerful tool, which allows investigating and characterizing the modifications of the structure in covalently bonded compounds. Hence the observed porcelain spectral feature at $\sim 1050 \text{ cm}^{-1}$ is due to SiO for the five compositions. From our study, as well as the literature reviewed it appears that investigators uniformly confirm the benefits of IR spectroscopy concerning identification of chemical functional groups of the different chemical compositions.

Keywords : porcelain, IR, quartz, alumina, talc