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Geochemistry and mineralogy of clinker, Portland cement and dust produced in Neka cement factory and it's environmental impacts, Mazandarn Province

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Abstract: Portland cement could be produced by heating the raw materials (clay, limestone) about 1500°C which clinker will be formed. Geochemical and mineralogical studies of clinker, Portland cement, cement kiln dust and cement mill dust have been carried out by optical microscopy, X-ray diffraction and X-ray florescence. In phase system diagram (CaO-Al_2O_3-SiO_2), chemical components of clinker cement occurred in C_3S-C_2S-C_3A triangular. Clays play important in adsorption of trace elements and heavy metals in the raw materials of cement factory of Neka. According to Bogue equation, this clinker and Portland cement coincide with international standard of cement. Cement kiln dust could be reuse as raw material of cement factory. Mineralogical study of clinker indicates the presence of calcium silicates and brown millerit minerals, while calcium silicates (tricalcium silicate and dicalcium silicate), gypsum, larnit, brown millerit and calcite minerals are indentified in Portland cement. Mineralogical study of cement kiln dust indicates the presence of calcite, quartz, muscovite –illite and chlorite minerals, while calcium silicates (tricalcium silicate and dicalcium silicate), gypsum, larnit and brown millerit minerals are indentified in cement mill dust.

Keywords: *Mineralogy; Geochemistry; clinker; Portland cement; Neka; cement kiln dust; cement mill dust.*

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