Cement production has been subject to several technological changes, each of which requires detailed knowledge about the high multiplicity of processes, especially the high temperature process involved in the rotary kiln. This article gives an introduction to the topic of cement, including an overview of cement production, selected cement properties, and clinker phase relations. An extended summary of laboratory-scale investigations on clinkerization reactions, the most important reactions in cement production, is provided. Clinker formations by solid state reactions, solid−liquid and liquid−liquid reactions are discussed, as are the influences of particles sizes on clinker phase formation. Furthermore, a mechanism for clinker phase formation in an industrial rotary kiln reactor is outlined.

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