Synthesis of pure Portland cement phases

Pure phases commonly found in Portland cement clinkers are often used to test cement hydration behaviour in simplified experimental conditions. The synthesis of these phases is covered in this paper, starting with a description of phase relations and possible polymorphs of the four main phases in Portland cement, i.e. tricalcium silicate, dicalcium silicate, tricalcium aluminate and tetracalcium alumino ferrite. Details of the process of solid state synthesis are described in general including practical advice on equipment and techniques. Finally, some exemplary mix compositions designs are given that have been used successfully by the authors.
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