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Sommario/riassunto

Aside from water the materials which are used by mankind in highest quantities arecementitious materials and concrete. This book shows how the quality of the technical product depends on mineral phases and their reactions during the hydration and strengthening process. Additives and admixtures infl uence the course of hydration and the properties. Options of reducing the CO2-production in cementitious materials are presented and numerous examples of unhydrous and hydrous phases and their formation conditions are discussed. This editorial work consists of four parts including cement composition and hydration, Special cement and binder mineral phases, Cementitious and binder materials, and Measurement and properties. Every part contains different contributions and covers a broad range within the area. ContentsPart I: Cement composition and hydrationDiffraction and crystallography applied to anhydrous cementsDiffraction and crystallography applied to hydrating cementsSynthesis of highly reactive pure cement phasesThermodynamic modelling of cement hydration: Portland cements - blended cements - calcium sulfoaluminate cements Part II: Special cement and binder mineral phasesRole of hydrotalcite-type layered double hydroxides in delayed pozzolanic reactions and their bearing on mortar datingSetting control of CAC by substituted acetic acids and crystal structures of their calcium saltsCrystallography and crystal chemistry of AFm phases related to cement chemistry Part III: Cementitious and binder materialsChemistry, design and application of hybrid alkali activated bindersBinding materials based on calcium sulphatesMagnesia building material (Sorel cement) - from basics to applicationNew CO2-reduced cementitious systemsComposition and properties of ternary binders Part IV: Measurement and propertiesCharacterization of microstructural properties of Portland cements by analytical scanning electron microscopyCorrelating XRD data with technological propertiesNo cement production without refractories