PARAMETER DELIMITATION OF THE WEAK SOLVABILITY FOR A PSEUDO-PARABOLIC SYSTEM COUPLING CHEMICAL REACTIONS, DIFFUSION AND MOMENTUM EQUATIONS

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Abstract. The weak solvability of a nonlinearly coupled system of parabolic and pseudo-parabolic equations describing the interplay between mechanics, chemical reactions, diffusion and flow modelled within a mixture theory framework is studied via energy-like estimates and Gronwall inequalities. In analytically derived parameter regimes, these estimates ensure the convergence of discretized-in-time partial differential equations. These regimes are tested and extended numerically. Especially, the dependence of the temporal existence domain of physical behaviour on selected parameters is shown.

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