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Biodegradation in Porous Landfill Bodies

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In this contribution a constitutive model based on the macromechanical Theory of Porous Media (TPM) for a saturated thermo elastic porous body has been developed. The body under investigation consists of an organic and inorganic moisturized phase and a gas phase. Based on a consistent thermomechanical treatment the governing equations and constitutive equations will be given. Thus, we obtain a mathematical concept to describe the motion of the solid phases, the pressure of the gas phase, the temperature of the mixture and the biodegradation of organic material into a gas mixture of methane and carbon dioxide produced by bacterial decomposition during stable methane fermentation (biogas). Nevertheless, the calculation concept must be fit for specific tasks, whereby an absorbed comprehension of the investigated problem is required. Therefore, we practice an interdisciplinary cooperation with the Institute of Waste Management in Essen, Germany, so that we are able to present first emboldening results.

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