

Elastic-electroactive biological media are sensitive to both mechanical and electric forces. Their active behavior is often associated with the presence of reinforcing fibers and their excitation-contraction coupling is due to the interplay between the passive elastic tissue and the active muscular network. In this paper we focus on the theoretical framework of constitutive equations for viscous electroactive media. The approach is based on the additive decomposition of the Helmholtz free energy accompanied to the multiplicative decomposition of the deformation gradient in elastic, viscous and active parts. We describe a thermodynamically sound scenario that accounts for geometric and material nonlinearities.