We present an accurate, efficient, and stable scheme for the Cahn-Hilliard-Stokes-Darcy system for two-phase flows in karstic geometry. The scheme is first order accurate in time and satisfies a modified energy law at the discrete level. The most salient feature of the scheme is that it is completely decoupled in the sense that only a Cahn-Hilliard solver, a Stokes solver, and a Darcy solver are required at each time step. Our numerical experiments support our theoretical results. (Received January 11, 2017)