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Shibin Dai* (sdai4@ua.edu), Department of Mathematics, The University of Alabama, Tuscaloosa, AL 35487, and **Keith Promislow**. *Degenerate FCH Functional and Defects in Amphiphilic Structures*.

We present a modified Functionalized Cahn Hilliard (FCH) functional which models highly amphiphilic systems in solvent. A molecule is highly amphiphilic if the energy of a molecule isolated within the bulk solvent molecule is prohibitively high. For such systems once the amphiphilic molecules assemble into a structure it is very rare for a molecule to exchange back into the bulk. The highly amphiphilic FCH functional has a well with limited smoothness and admits compactly supported critical points. We consider sequences with bounded energy whose support resides within an ε -neighborhood of a fixed interface. We show that the FCH energy is uniformly bounded below, independent of $\varepsilon > 0$, and identify assumptions on tangential variation of sequences that guarantee the existence of subsequences that converge to a weak solution of a rescaled bilayer profile equation, and show that sequences with limited tangential variation enjoy a lim inf inequality. For fixed codimension one interfaces we construct bounded energy sequences which converge to the bilayer profile and others with larger tangential variation which do not converge to the bilayer profile but whose limiting energy can violate the lim inf inequality, depending upon the energy parameters. (Received January 06, 2019)