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Aggregation equations are continuum models for interacting particle systems with attractive pairwise interaction potentials. The main phenomenon of interest is that, even with smooth initial data, the solutions can concentrate mass in finite time (i.e. a Dirac delta function appears in the solution). We show local well-posedness of  $L^p$  solutions and global well-posedness of weak measure solutions. For the latter, our approach is based on the theory of gradient flows in the space of probability measures endowed with the Wasserstein metric. The interplay between the  $L^p$  theory and the measure theory give a good understanding of the mechanism by which a Dirac delta function appears in the solution. (Received September 15, 2009)