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A chemical reaction for mixing EMILIE GUILBERT, CHRISTOPHE ALMARCHA, EMMANUEL VILLERMAUX, Aix Marseille Université, CNRS, Centrale Marseille, IRPHE UMR 7342, 13384 Marseille, France — We introduce a new, versatile chemical reaction between two transparent reactants producing a fluorescent product in water. The kinetic of this second order reaction, besides depending on the reactants concentration and on temperature, can be adjusted by varying the pH of the substrate, in a way that the reaction time spans over several decades (from a fraction of a second, to hours). The fluorescence intensity is directly proportional to the product concentration, allowing to measure molecular mixing in a variety of situations. We will describe in particular the interplay between molecular diffusion, reaction kinetics and substrate deformation for a blob deposited in a stirred medium in which it reacts as it mixes.

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