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Dynamics of fractal cluster colloidal gels with embedded active Janus particles MICHAEL SOLOMON, MEGAN SZAKASITS, WENXUAN ZHANG, University of Michigan — We find that fractal cluster gels of colloids in which platinum-coated Janus particles have been embedded exhibit enhanced mobility when the Janus particles are made active by the addition of hydrogen peroxide. Gelation is induced through addition of a divalent salt, magnesium chloride, to an initially stable suspension of Janus and polystyrene colloids, each of size about 1 micron. After the gels have been created, the embedded Janus colloids are activated by hydrogen peroxide, which is delivered to the system through a porous hydrogel membrane. We vary the ratio of active to passive colloids in the gels from about 1:20 to 1:8. Changes in structure and dynamics are visualized by two channel confocal laser scanning microscopy. By image analysis, we determine the particle positions and compute the mean squared displacement (MSD) of all particles in the gel. We measure the mobility enhancement in the fractal gels as a function of hydrogen peroxide concentration and Janus particle concentration and discuss the results in terms of the force provided by each active particle to the fractal gel network.

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