

my theory of what has been going on... (if this pen runs out of ink I'll try & switch to blue)

HG resides in hydrophobic hexane droplets — in two forms — one is HG not bound to anything, the other is a Brønsted acid formed by rxn with  $H_2O$ .

As these droplets mix in the suspension per medium they collide & are adsorbed (uptaken) into monomer droplets — the Brønsted acid form of HG &  $H_2O$  immediately neutralizes per — HG not bound to anything forms Brønsted acid with any  $H_2O$  in the monomer droplet & then initiates per.

Assumptions...

per is used first inside each droplet & multiple chains can be made by CT to monomer or small amounts of  $H_2O$  present in the droplet (monomer)

Initiation will be important if HG is dissolved in the solvent that is not very hydrophobic — as the solvent becomes more hydrophilic the HG is more likely to be in the aqueous phase & not initiate per or become solvated by many waters that weaken it's acidity, & even if it enters the monomer droplet in such a state it's pKa is too high to initiate per

As the vol% of the per mixtures ↑ in monomer or hydrophobic organics the % conv. ↑ — HG is more likely to enter such a droplet — also the aqueous chain end is less likely to contact the droplet surface & terminate with the aqueous phase.

Soap or steric stabilizers may improve yields by shielding droplet surface from  $H_2O$  & providing surface termination with  $H_2O$

Slower addition of initiator stock & more dilute initiator stock improves yields as droplets are continually hit with initiator droplets

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