

Electronic Supplementary Information (EESI):

Fig. S1: IR spectrum of the PVA, PVA-S5, PVA-S17, PVA-S34, PVA-45

The Infrared (IR) measurements details, assigned functional groups in IR spectra and results Fig. S2: Micrographs of the PVA-S34

Fig. S3 Magnified micrograph of PVA-S5 and PVA-S45

Modelling of SAXS and SANS data

Fig. S4 SANS profiles of PVA-silica composite films

Figure S5 Size distribution of silica nanoparticles in the composite

Fitting function of the temporal evolution of the dehydration kinetics

Fig. S6 Variation of local volume fraction in the dispersion ϕ_{sd} as a function of bulk volume fraction ϕ_b .

Schematic S1: The schematic showing SAXS measurements setup

Schematic S2: Schematic diagram showing the definition of local and bulk volume fraction