Supporting Information

Ionic-liquid-processed keratin-based biocomposite films with cellulose and chitin for sustainable dye removal

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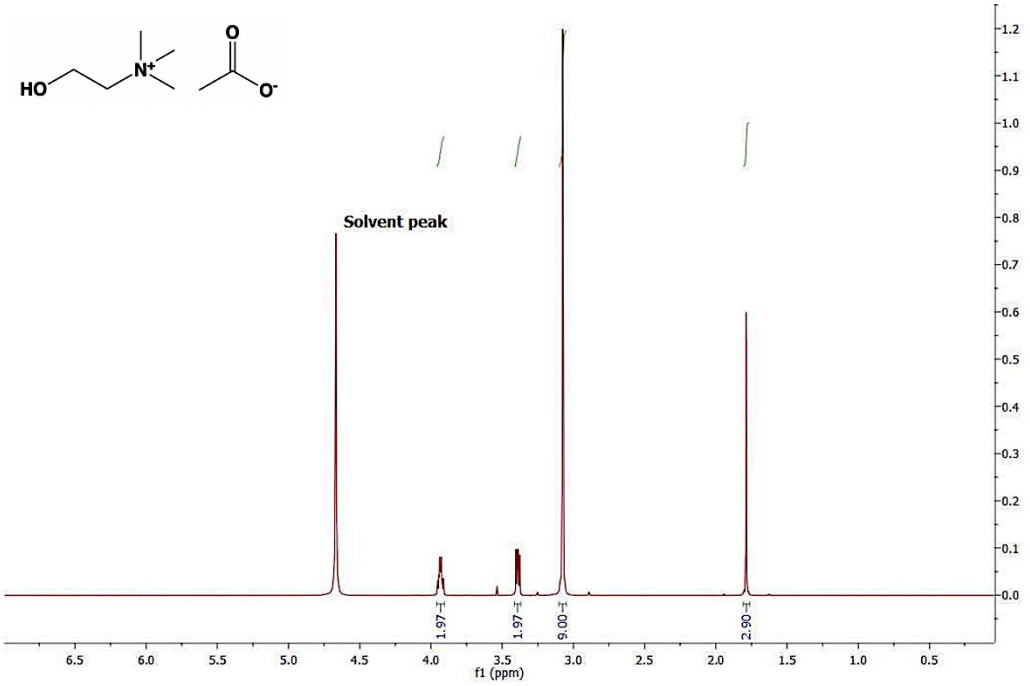

Figure S1. Cholinium acetate, $[N_{111(2OH)}][C_1CO_2]$, ^1H NMR (D_2O, 500 MHz, [ppm]): 3.93 (2H, m); 3.39 (2H, t, J = 20 Hz); 3.08 (3H, s); 1.79 (3H, s).

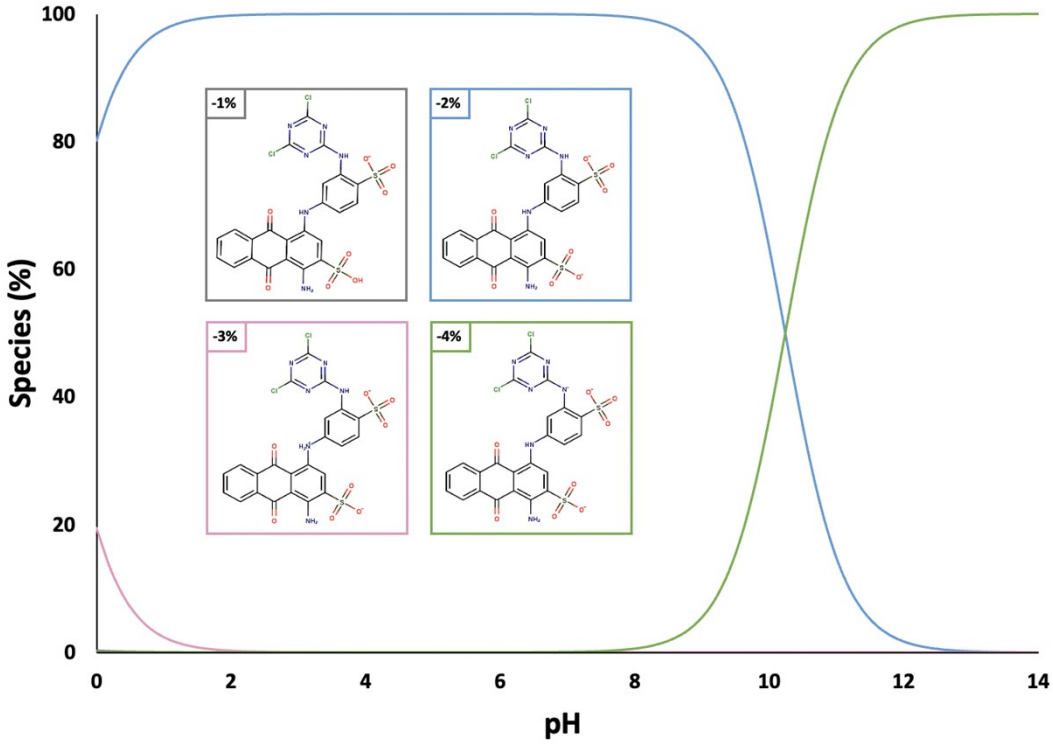

Figure S2. Evaluation of the pH on the speciation changes of Reactive Blue 4 dye. The grey, blue, pink, and green curves represent the deprotonation percentage of Reactive Blue 4 (data from Marvin 21.14) [33].

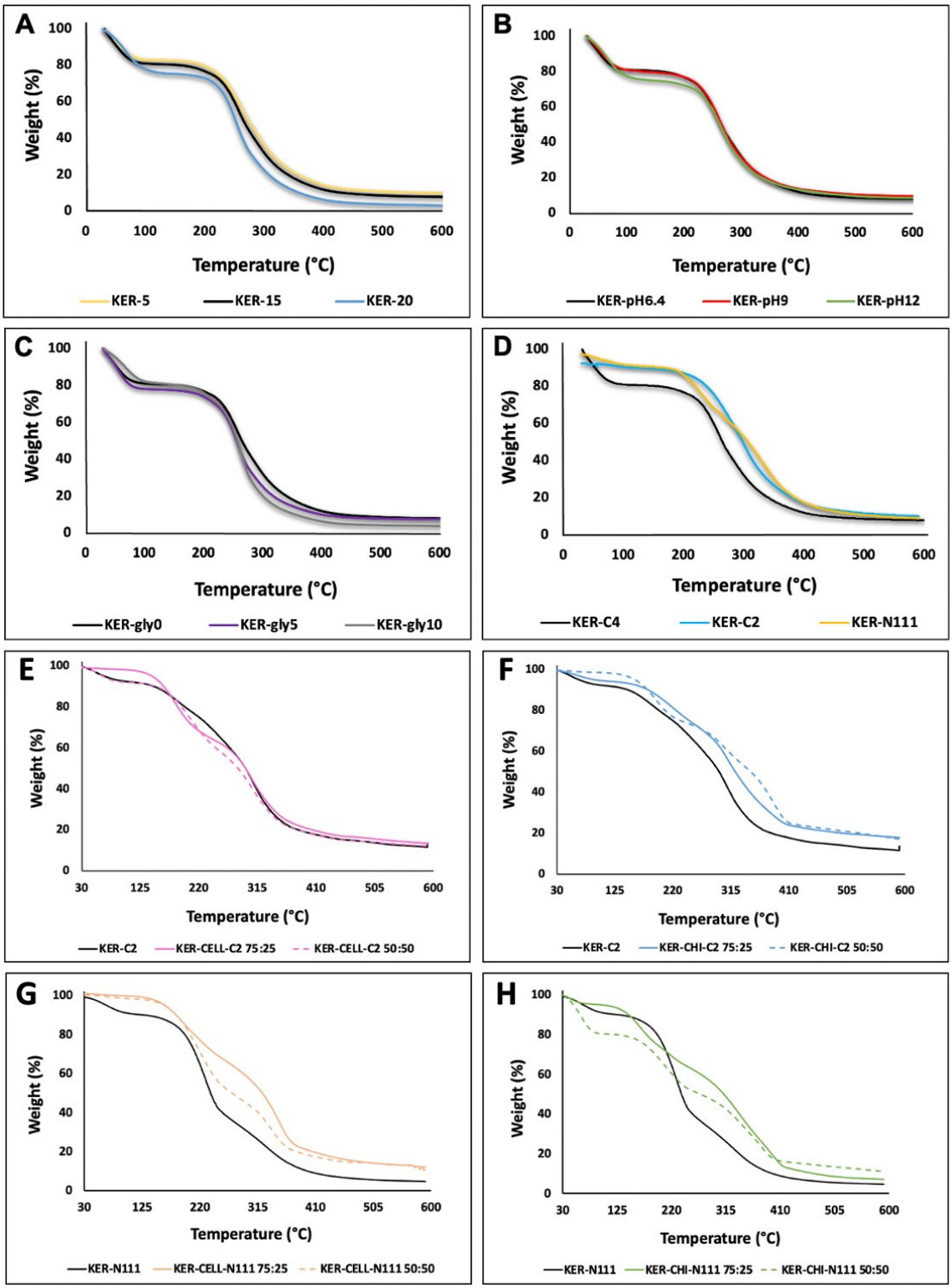

Figure S3. TGA curves of the keratin films (A-D); keratin-cellulose films (E and G); and keratin-chitin films (F and H) samples processed using different conditions.

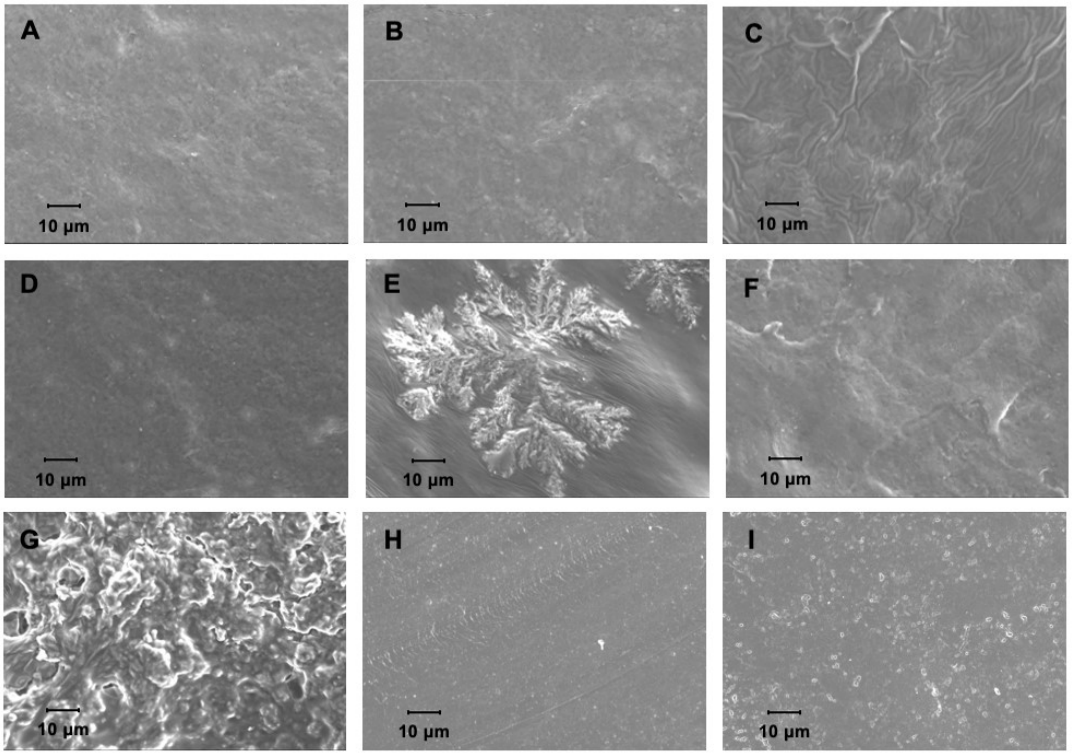

Figure S4. SEM images of keratin films: KER-5 (A); KER-15 (B); KER-20 (C); KER-pH9 (D); KER-pH12 (E); KER-gly5 (F); KER-gly10 (G); KER-C2 (H); KER-N111 (I).

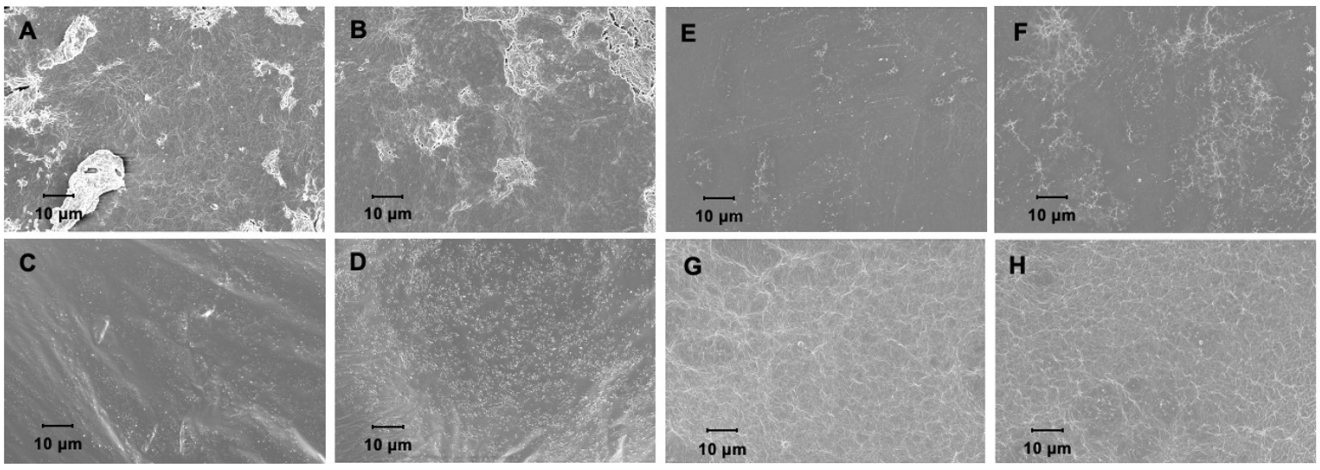

Figure S5. SEM images of keratin blended films processed with different ILs (A-D) $[C_2C_1im][C_1CO_2]$ and (E-H) $[N_{111(2OH)}][C_1CO_2]$: KER-CELL-C2 75:25 (A); KER-CELL-C2 50:50 (B); KER-CHI-C2 75:25 (C); KER-CHI-C2 50:50 (D); KER-CELL-N111 75:25 (E); KER-CELL-N111 50:50 (F); KER-CHI-N111 75:25 (G); KER-CHI-N111 50:50 (H).