Supporting Information

Facile and mild preparation of brookite-rutile heterophase junction

TiO$_2$ with high photocatalytic activity based on deep eutectic solvent (DES)

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To provide more data to further confirm the effect of defects on the activity, we also repaired the defects of TiO$_2$ sample synthesized at 2:1 molar ratio of ChCl to retaine, and contrasted the XRD patterns, HRTEM images and the photocatalytic activities of the synthesized TiO$_2$ before and after repairing defects. It can be seen from Fig.S1† that the results of XRD patterns and HRTEM images are consistent with that of TiO$_2$ synthesized with 1:6 molar ratios of ChCl to retaine. And the photocatalytic activity after defect repairing is 9.48 mmol·h$^{-1}$·g$^{-1}$, which is obviously lower than that before repairing (14.51 mmol·h$^{-1}$·g$^{-1}$). This also illustrates that the defects resulted from lattice disorder are indeed helpful for improving the photocatalytic activity.