Supporting Material

Schem. S1. Molecular structures of Methylene blue dye

Schem. S2. Molecular structures of ([bmim][BF₄]) Ionic Liquid
Fig. S1. Schematic of the experimental setup used for photocatalytic degradation of MB dye.
**Fig. S2.** FE-SEM images of (a) pure PMMA and (b) PMMA/TiO$_2$/IL (S3).
Fig. S3. XRD patterns of (a) bare TiO$_2$ powder, (b) pure PMMA, (C) 0.006 wt% PMMA/TiO$_2$/IL, (D) 0.01 wt% PMMA/TiO$_2$/IL (S3), (e) 0.012 wt% PMMA/TiO$_2$/IL.
Fig. S4. Postulated mechanism of the photoinduced charge transfer processes on TiO$_2$ and IL molecule that collect visible light.
Fig. S5. Reusability of the photocatalyst for photocatalytic decolorization of MB dye solution under visible irradiation.