**Supporting Information**

Alkaline hydrolysis of photovoltaic backsheet containing PET and PVDF for the recycling of PVDF

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**FT-IR spectroscopic analysis of the backsheet**

 The exterior of the backsheet was analyzed by Fourier-transform infrared spectroscopy (FT-IR) (Thermo Scientific, Nicolet Summit, attenuated total reflectance method, software: OMNIC Specta) for polymer identification. Thereafter, the outer layer was manually removed, and the inner plastic was also analyzed by FT-IR spectroscopy. The OMNIC spectroscopy software equipped with the search library of HR Specta Polymers and Plasticizers by ATR was used for the analysis. The top pair matches are shown in Fig. S1. In the spectrum of the external plastic, characteristic peaks for PVDF such as C-H bending (1400 cm-1), C-F stretching (1180 cm-1), and C-H wagging (870 cm-1) were observed. In the spectrum of the internal plastic, characteristic peaks for PET such as those attributed to C-O stretching (1110 and 1238 cm-1) and the stretching of the C=O moiety of the ester group (1735 cm-1) were observed.





**Fig. S1** FT-IR spectroscopic analysis of the backsheet: (a) external plastic, (b) internal plastic

**FT-IR analysis of the recovered TPA**

 The recovered and reagent TPA were analyzed by FT-IR spectroscopy. TPA (Wako 1st Grade, FUJIFILM Wako Pure Chemical Corporation) was used as the reagent. Characteristic peaks for TPA such as the C=O stretching vibration (1683 cm-1) and the O-H vibration (2200–3300 cm-1) were observed.



**Fig. S2** FT-IR spectroscopic analysis of the recovered TPA