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2 **Supplementary information**

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4 **Rapid dissolution of cellulose in $\text{AlCl}_3/\text{ZnCl}_2$ aqueous system at room**
5 **temperature and its versatile adaptability in functional materials**

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9 **Table S 1.** The cost of solvents and energy in the process of dissolving one gram of cellulose in

10 $\text{AlCl}_3/\text{ZnCl}_2$ ($\text{Al}^{3+}:\text{Zn}^{2+}=1:9$) aqueous system.

11 **Fig. S1.** Tensile stress-strain curves of the cellophane and RCF from $\text{ZnCl}_2 \cdot 4\text{H}_2\text{O}$ and $\text{AlCl}_3/\text{ZnCl}_2 \cdot 4\text{H}_2\text{O}$

12 solutions.

13 **Fig. S2.** (a)The experimental HRTEM image and (b) Energy dispersive X-ray spectrum (EDS) and XRD

14 pattern(c) of Al-ZnO RCF.

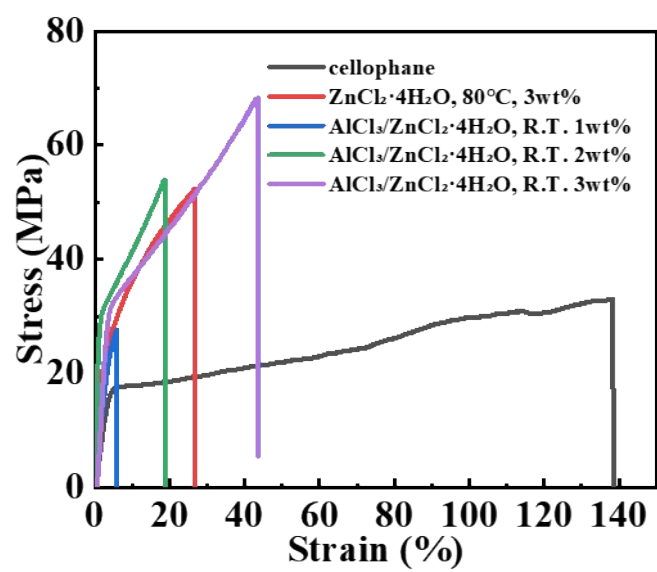
15 **Fig. S3.** Tensile strength of Al-ZnO RCF before and after photocatalysis under UV irradiation.

16 **Table S2.** Crystallinity of cellulose before and after regeneration

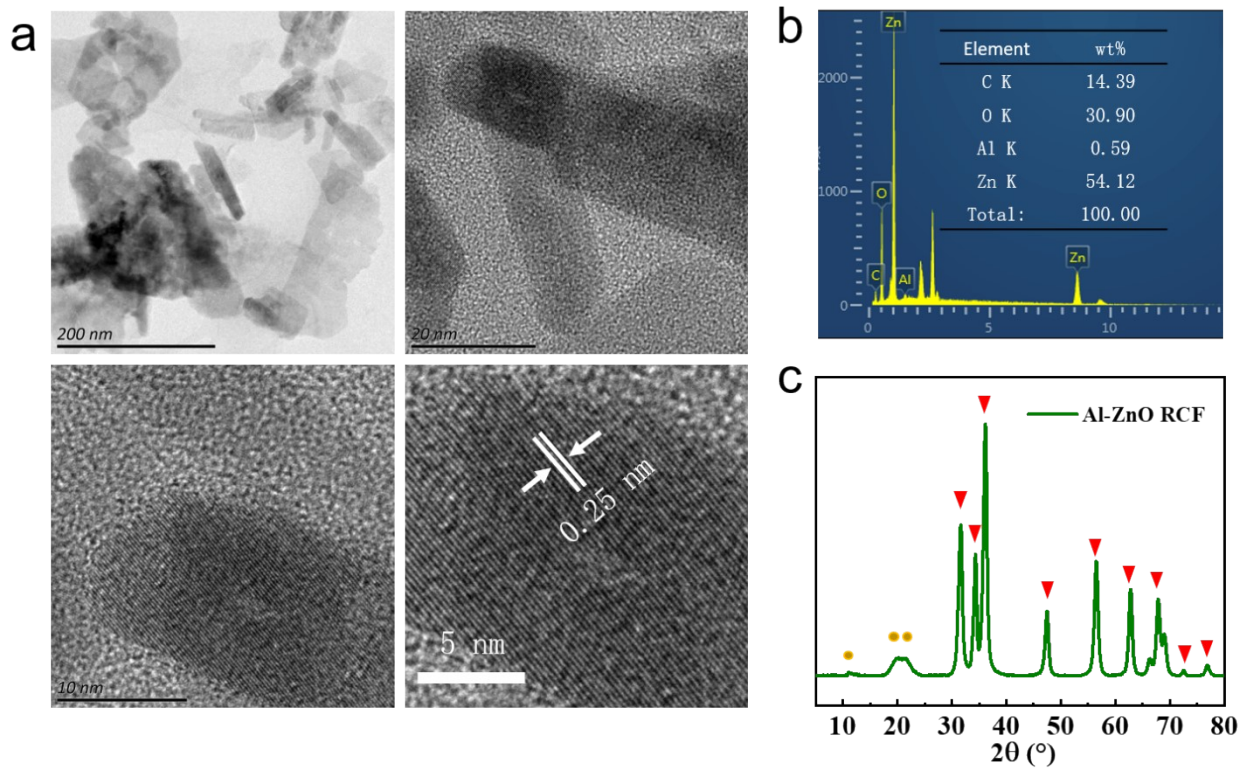
17 **Table S 1.** The cost of solvents and energy in the process of dissolving one gram of cellulose in $\text{AlCl}_3/\text{ZnCl}_2$ ($\text{Al}^{3+}:\text{Zn}^{2+}=1:9$)
18 aqueous system.

Chemical agent	$\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$	ZnCl_2
Price (\$/kg)	10.32	25.65
Dosage (g)	1.21	6.12
Solvent cost (\$/g)	0.0125	0.1570
5% dosage consumption (\$/g)	0.0006	0.0079
10 times dosage consumption (\$/g)	0.0045	0.0560

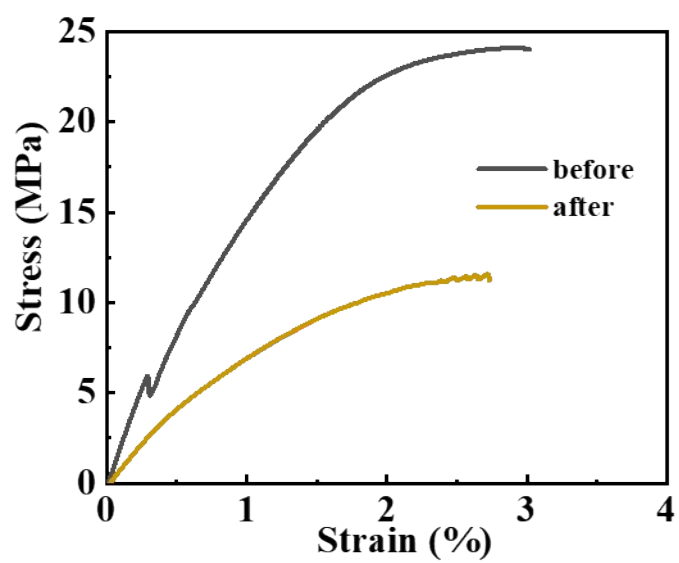
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22 **Fig. S1.** Tensile stress-strain curves of the cellophane and RCF from ZnCl₂·4H₂O and AlCl₃/ZnCl₂·4H₂O solutions.



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25 **Fig. S2.** (a) The experimental HRTEM image, (b) Energy dispersive X-ray spectrum (EDS), and (c) XRD pattern of Al-ZnO RCF.



26
27 **Fig. S3.** Tensile strength of Al-ZnO RCF before and after photocatalysis under UV irradiation.

28 **Table S2.** Crystallinity of cellulose before and after regeneration

Crystalline	Position of characteristic peak			Crystallinity (%)
	1-10	100	200	
500CF I	14.74	16.16	22.3	74.84%
2000CF I	14.64	16.38	22.56	67.84%

Crystalline	Position of characteristic peak			Crystallinity (%)
	1-10	100	020	
500RCF II	12.42	20.56	22.02	53.41%
2000RCF II	12.16	19.84	21.46	37.96%

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