coatings

Supplementary Materials: Optimization of the Active Layer P3HT:PCBM for Organic Solar Cell

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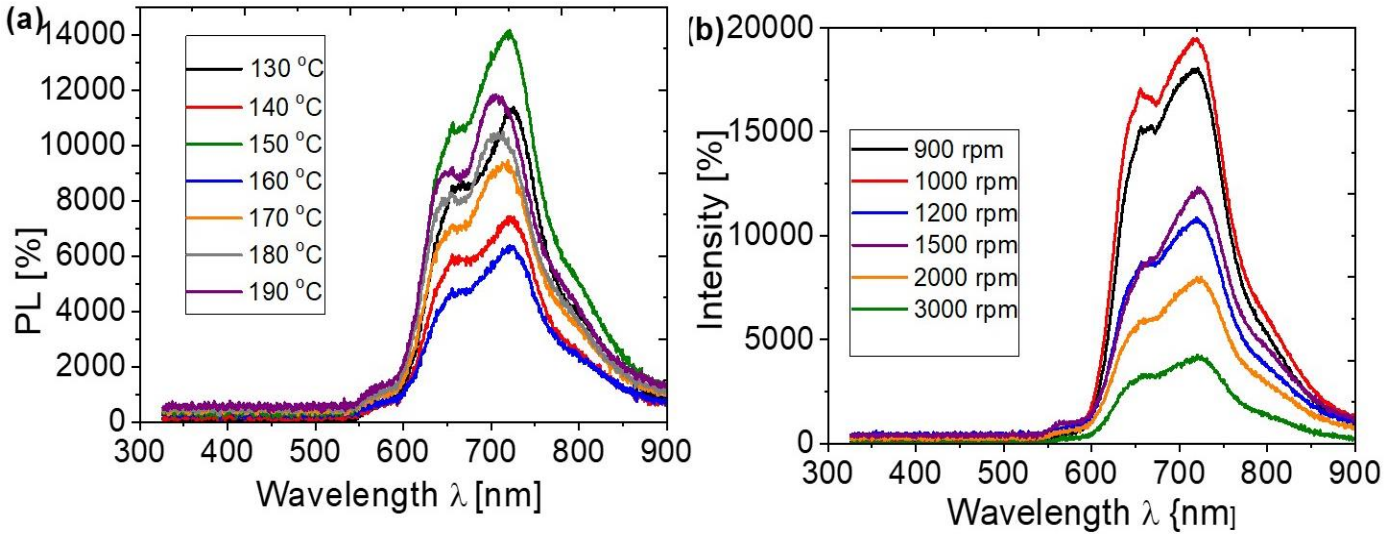


Figure S1. the photoluminescence of the P3HT:PCBM under (**a**) different annealing temperature, (**b**) different spin speed coating.

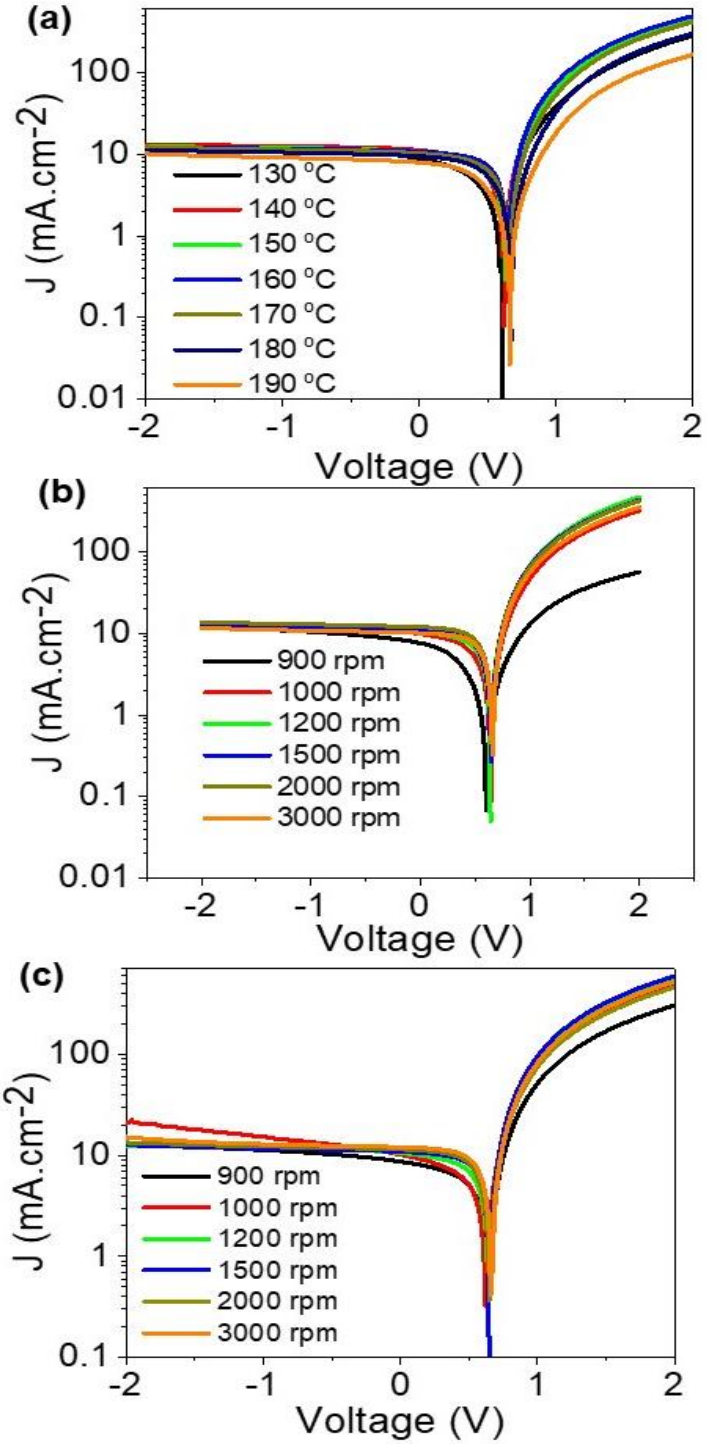
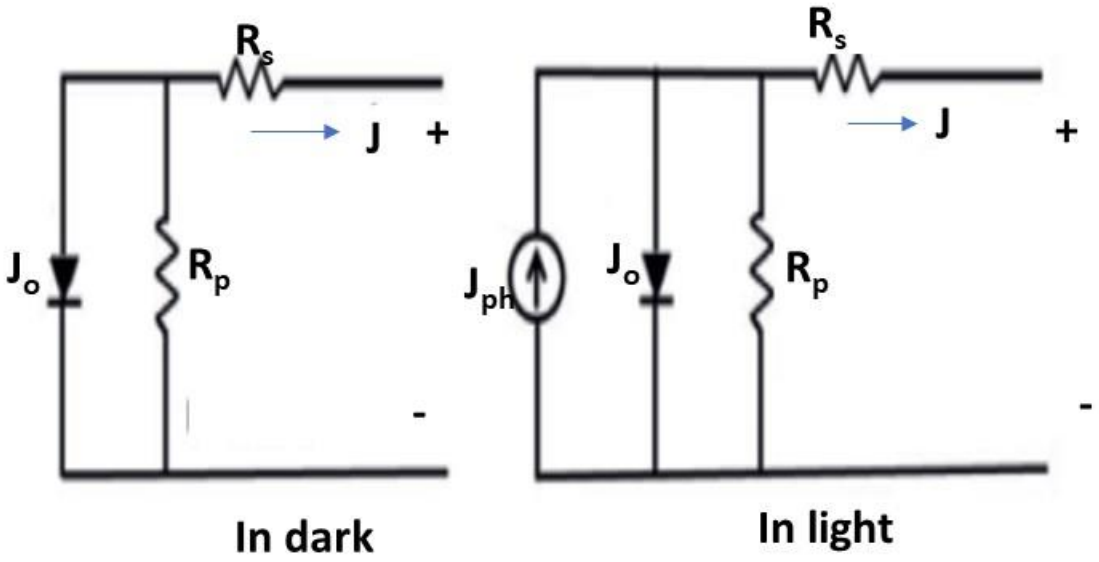


Figure S2. The integral values of I-V values in light for the effect of (**a**) annealing temperature, (**b**) spin speed coating using Al electrode, (**c**) spin speed coating using Mg-Al electrode.



(**a**) (**b**)

Figure S3. The equivalent circuit model represents R_S and R_P in (**a**) dark and (**b**) light.

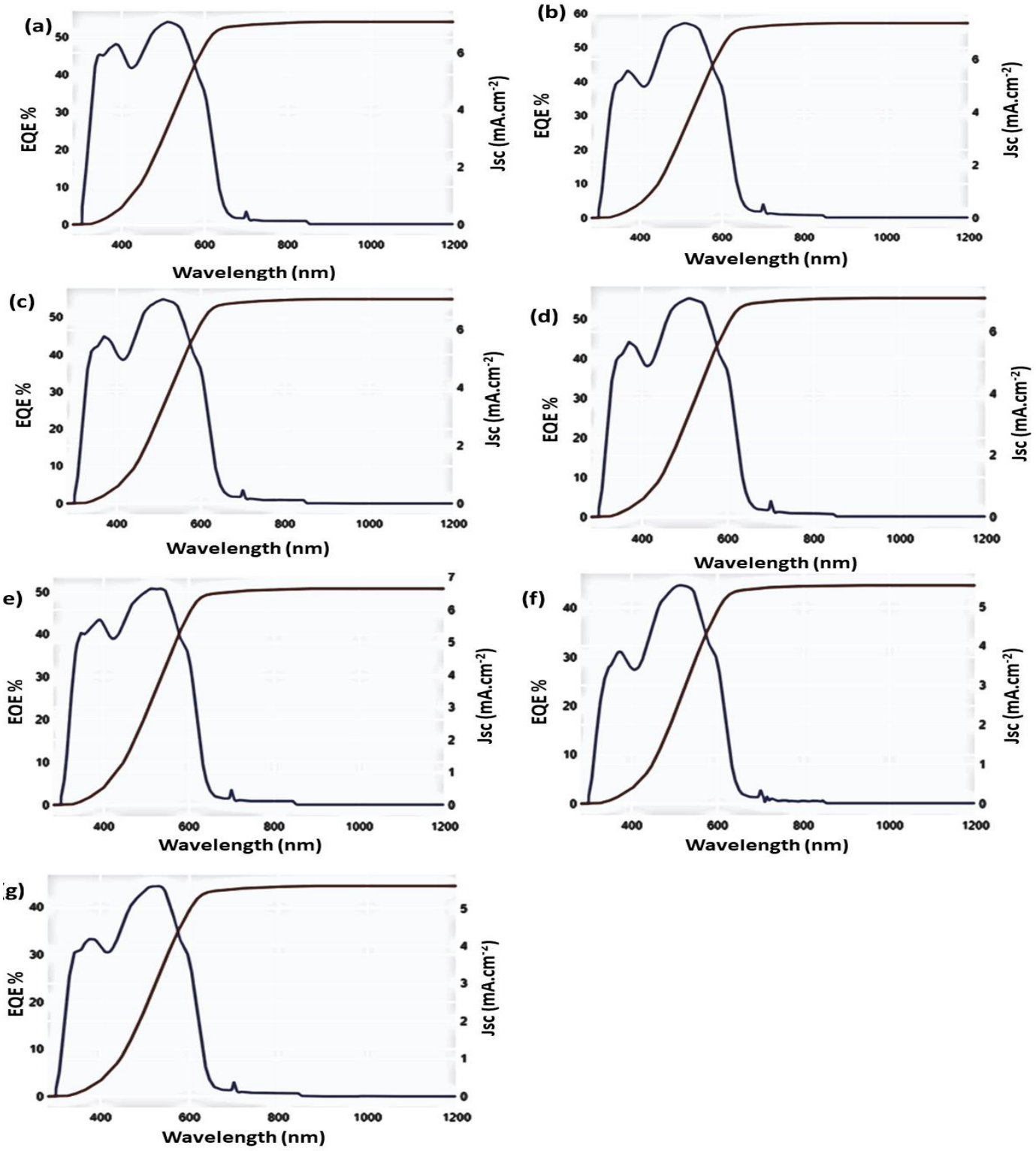


Figure S4. The *Jsc* and EQE relations under different wavelengths for (**a**) 130, (**b**) 140, (**c**) 150, (**d**) 160, (**e**) 170, (**f**) 180, and (**g**) 190 °C.

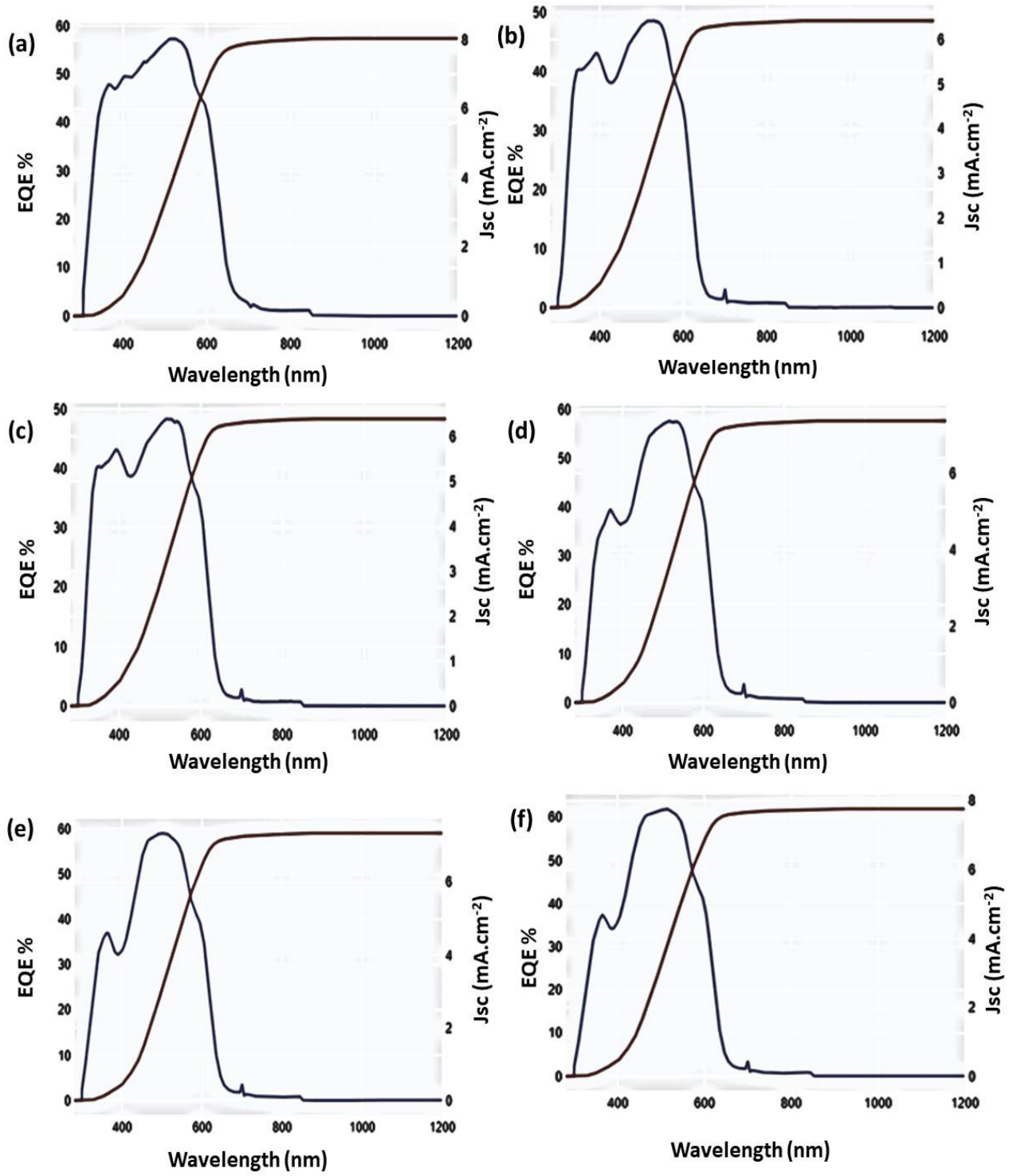


Figure S5. The *Jsc* and EQE relations under different wavelengths for (**a**) 900, (**b**) 1000, (**c**) 1200, (**d**) 1500, (**e**) 2000, and (**f**) 3000 rpm for the active layer using Mg-Al cathode.

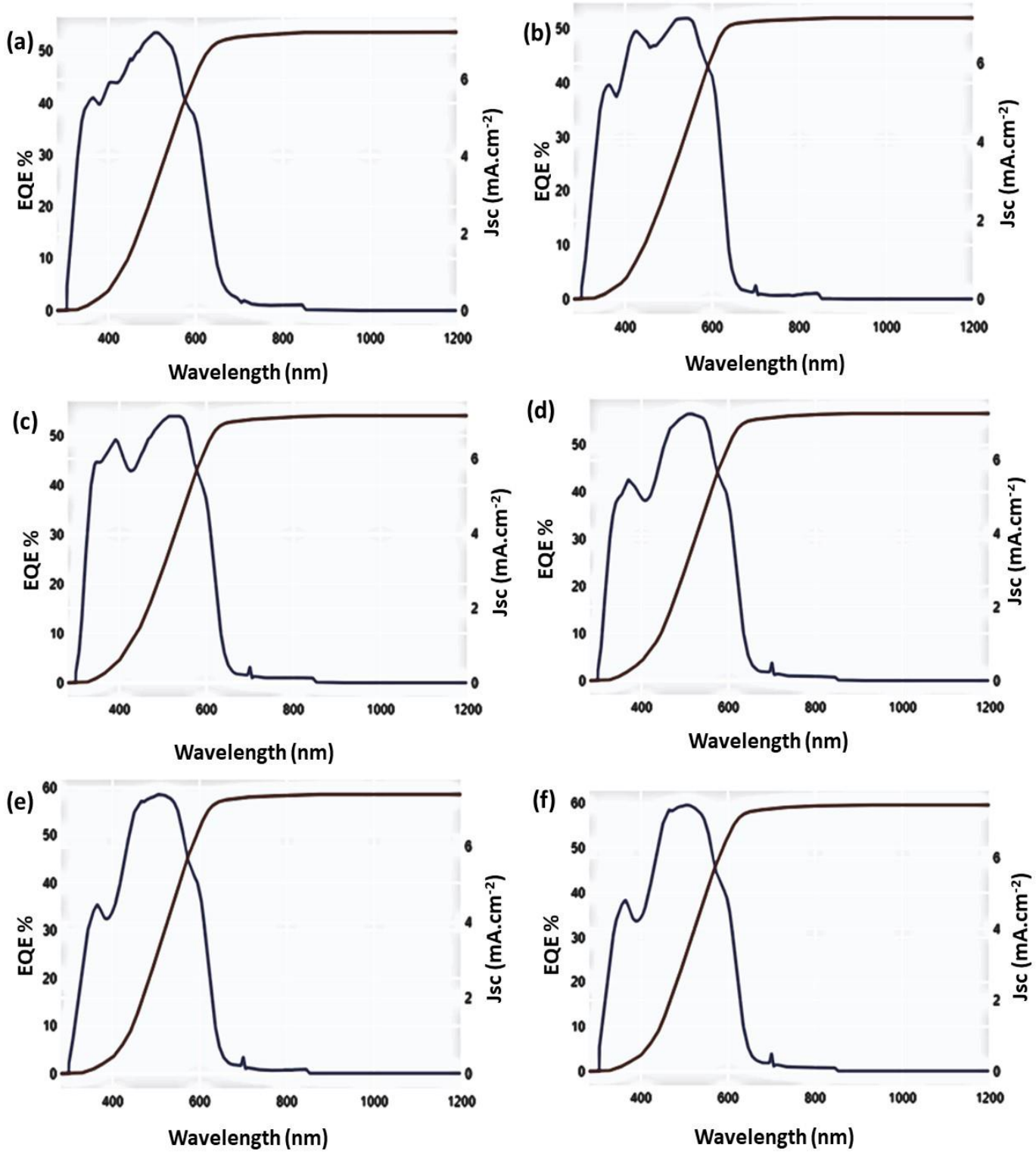


Figure S6. The *Jsc* and EQE relations under different wavelengths for (**a**) 900, (**b**) 1000, (**c**) 1200, (**d**) 1500, (**e**) 2000, and (**f**) 3000 rpm for the active layer using Al cathode.

Table S1. the J_{SC} values calculated from EQE values from Figure S4 under different annealing temperatures for the active layer.

Annealing Temperature (°C)	J_{SC} **(mA/cm²)**
130	7.08
140	7.37
150	7.06
160	7.10
170	6.66
180	5.54
190	5.59

Table S2. the J_{SC} values calculated from EQE values from Figures S5 and S6 under different spin speed coating for the active layer.

Spin Frequency (rpm)	**Cathode**	J_{SC} **(mA/cm²)**
900	Mg-Al	8.04
1000	Mg-Al	6.42
1200	Mg-Al	6.39
1500	Mg-Al	7.37
2000	Mg-Al	7.35
3000	Mg-Al	7.76
900	Al	7.24
1000	Al	7.15
1200	Al	7.14
1500	Al	7.27
2000	Al	7.38
3000	Al	7.47