Supplementary Materials

Article

Accurate Design of Solar Selective Absorber Based on Measured Optical Constants of Nano-thin Cr Film

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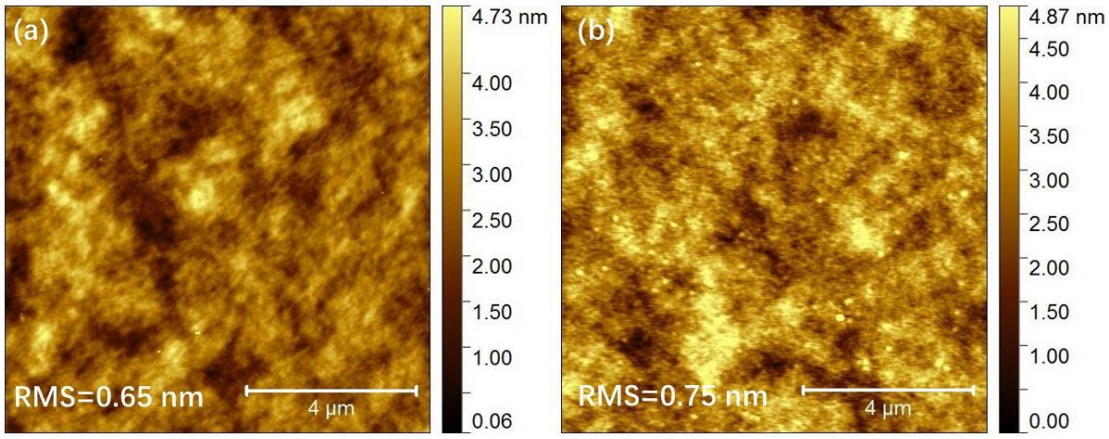

Figure S1. AFM images of the fabricated (**a**) 12.3-nm and (**b**) bulk Cr film sample.

Table S1. Optimized film structure for the six-layered solar selective absorber by using the optical constants of Cr film from the measurements or literature data [1].

Temperature (K)		**600**			
Optical constants of Cr		**Nano Cr**		**Literature data [1]**	
Solar concentration (Sun)		**1**	**100**	**1**	**100**
Film thickness	SiO_2	0	88.0	40.0	83.7
	Cr	3.7	8.4	2.0	3.5
	SiO_2	61.9	64.2	15.8	91.5
	Cr [1]	24.8	29.7	1.8	8.7
	SiO_2	7.2	44.7	47.8	80.6
	Cu	300	300	300	300

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Table S2. Optimized film thickness for each layer of six-layer solar selective absorber aiming to work at different temperatures and solar concentrations based on the measured optical constants of the ultrathin Cr layer.

Temperature (K)		**300**	**400**	**500**	**600**					**700**
Solar Concentration (Sun)			**1**		**1**	**5**	**10**	**50**	**100**	**1**
Film thickness	SiO_2	90.0	79.0	65.0	0	75.9	84.5	94.6	88.0	1.8
	Cr	8.3	7.6	7.3	3.7	7.4	8.2	8.6	8.4	4.8
	SiO_2	61.9	58.7	41.6	61.9	53.3	58.7	62.7	64.2	44.7
	Cr [1]	30.0	30.0	30.0	24.8	30.0	29.9	29.9	29.7	15.3
	SiO_2	31.4	27.5	4.9	7.2	13.5	26.0	32.2	44.7	3.3
	Cu	300	300	300	300	300	300	300	300	300

[1] The upper limit for the film thickness of Cr layer was 30.0 nm.

References

1 E. D.Palik, Handbook of Optical Constants of Solids; Academic Press: New York, NY, USA, 1998.