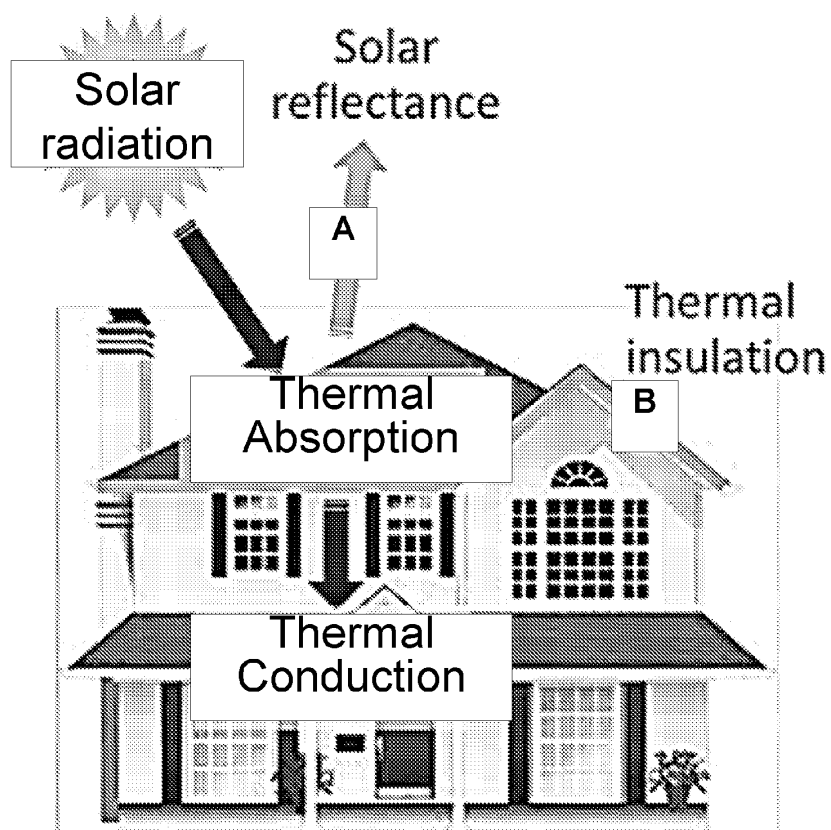


FIG. 1



PRIOR ART

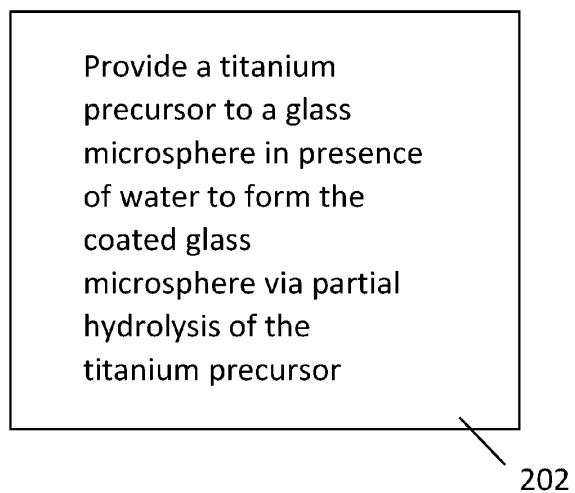
FIG. 2

FIG. 3

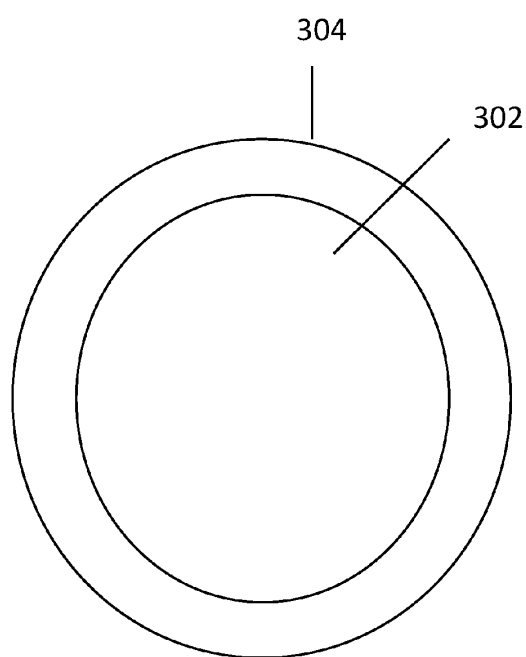


FIG. 4A

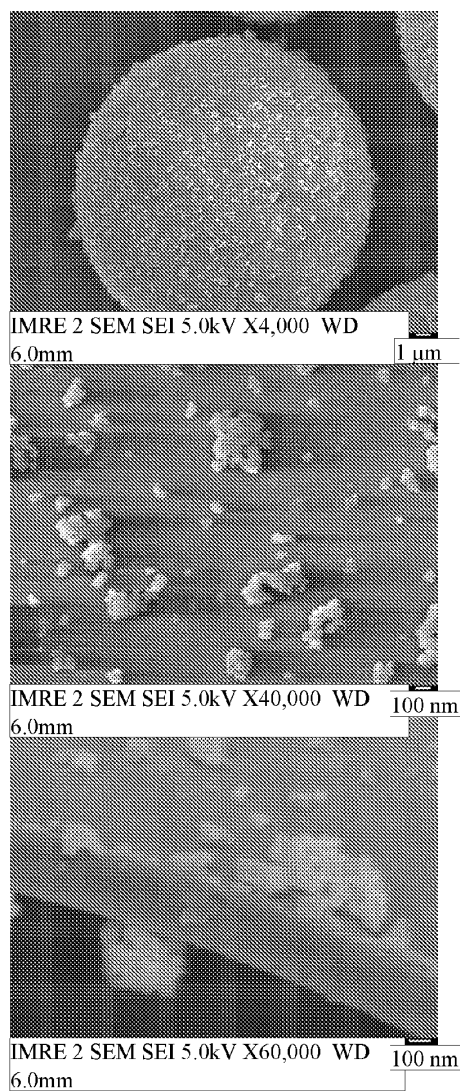


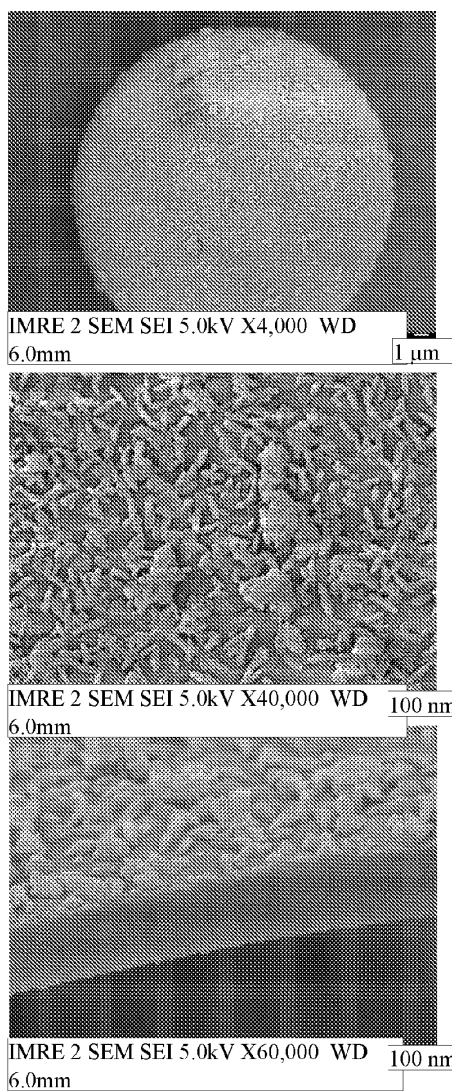
FIG. 4B

FIG. 4C

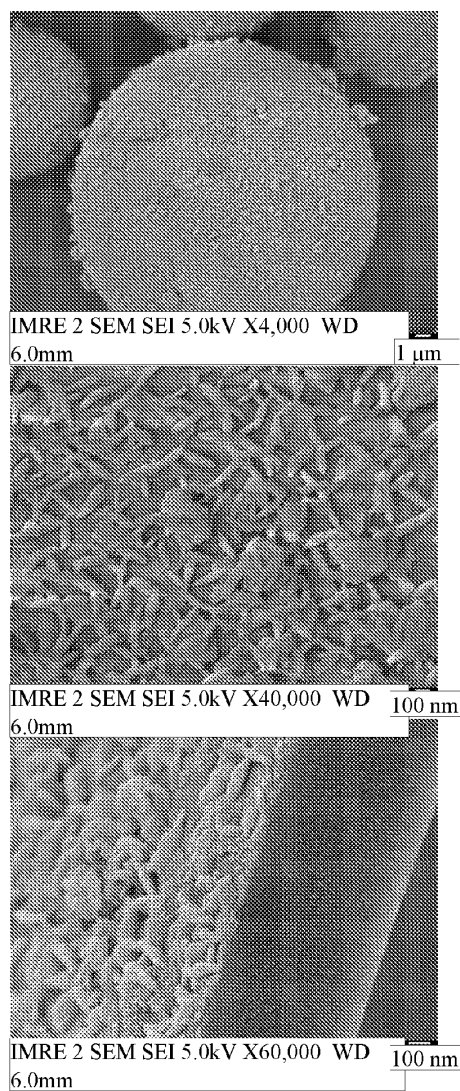


FIG. 4D

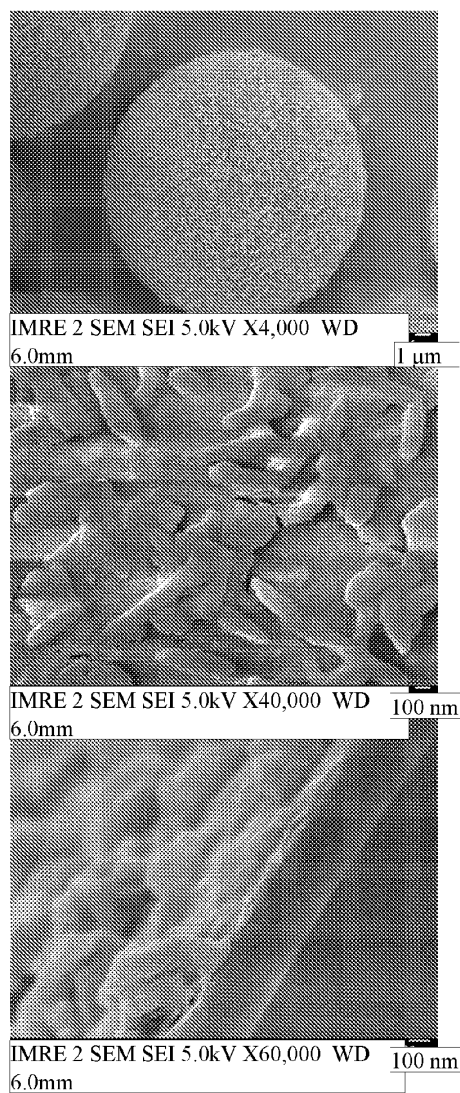


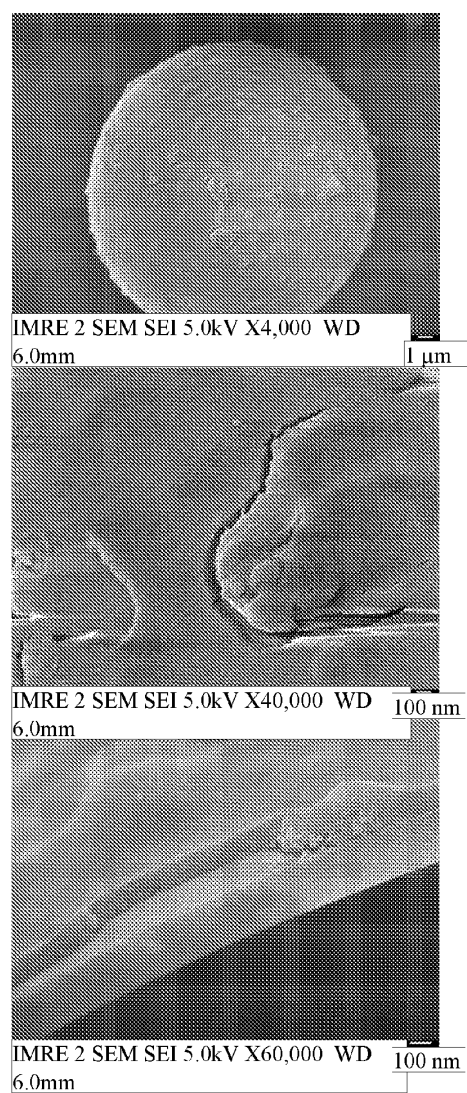
FIG. 4E

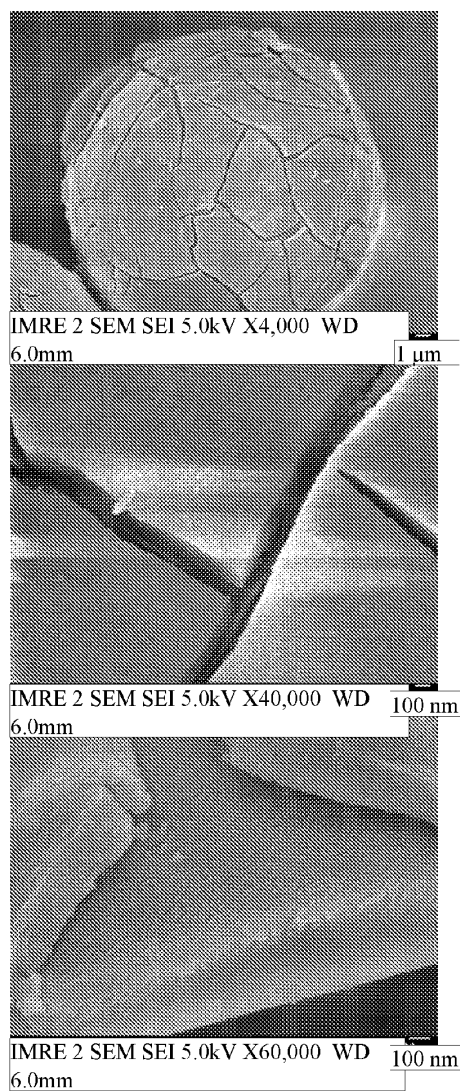
FIG. 4F

FIG. 5

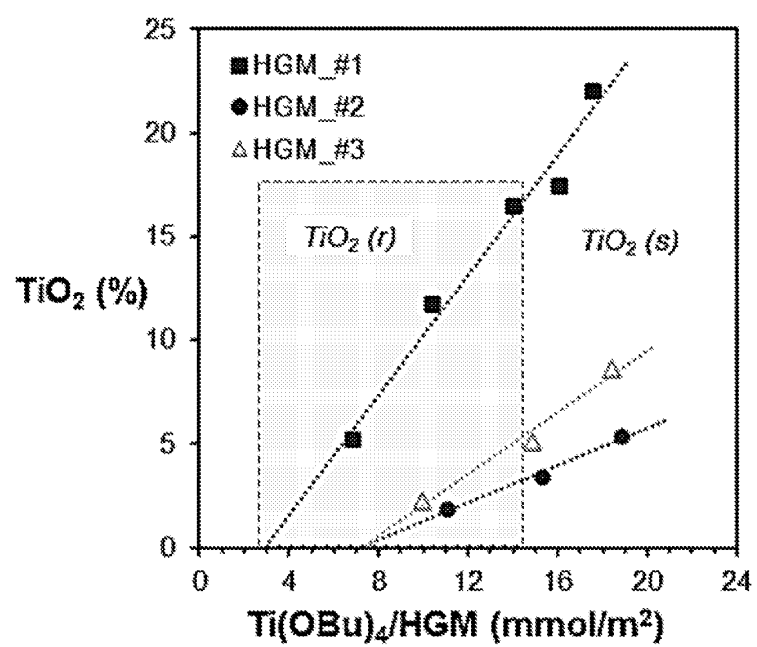


FIG. 6

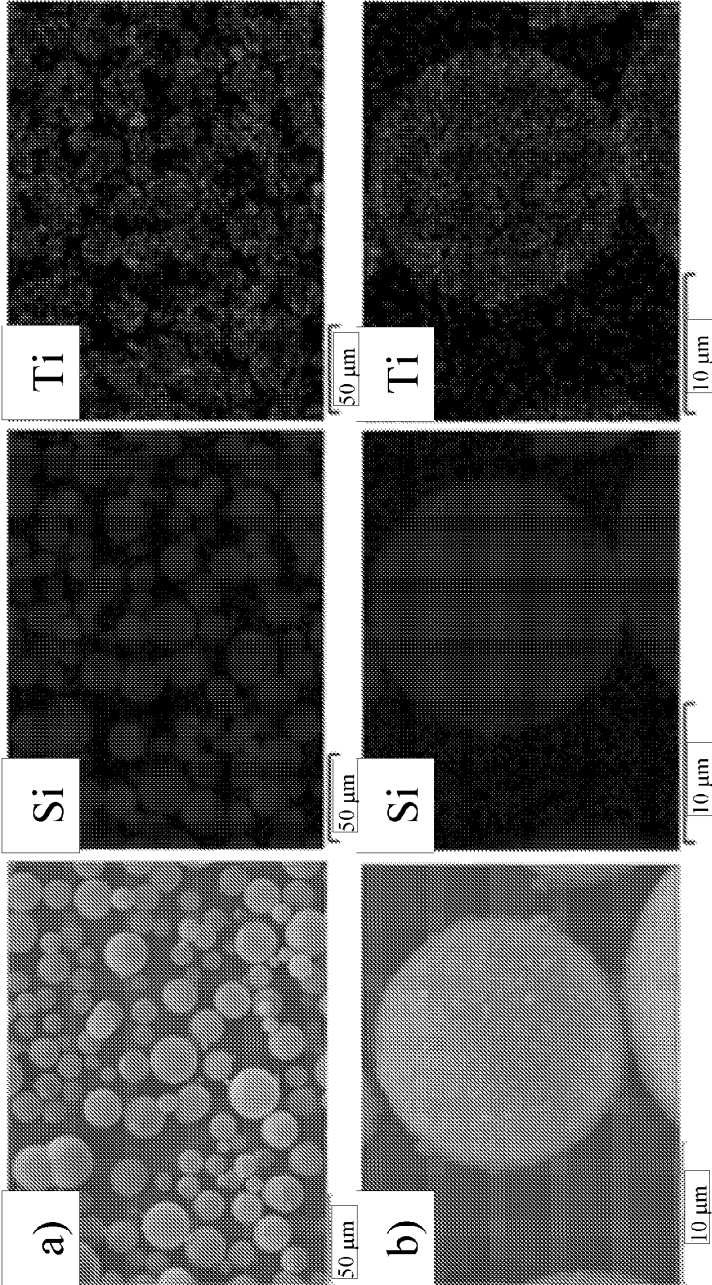


FIG. 7A

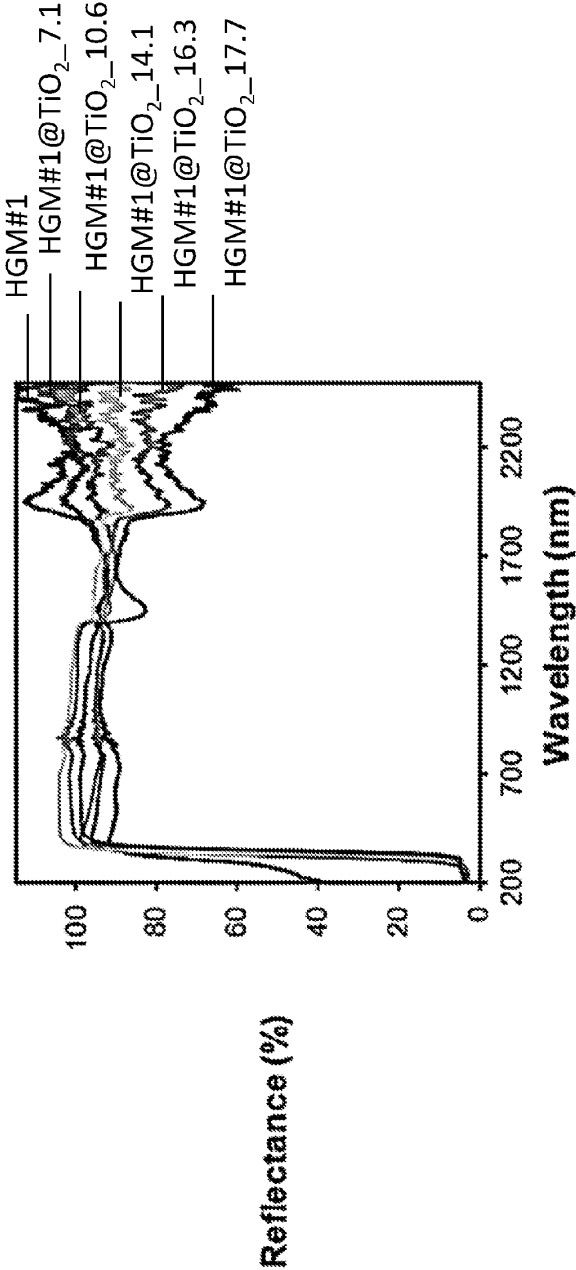


FIG. 7B

S/N	Diffuse Solar Reflectance (%)				Band gap, E_g (eV)	TiO ₂ morphology
	Full wavelength (280-2500 nm)	UVA/B (280-400 nm)	Visible (400-700 nm)	NIR (700-2500 nm)		
HGM_#1	91.80	89.89	90.43	92.98	-	-
HGM_#1@TiO ₂ _7.1	94.52	88.91	94.88	94.60	3.76	Rod-like, 40-50 nm (diameter) x 150-250 nm (length)
HGM_#1@TiO ₂ _10.6	95.09	89.24	96.72	94.20	3.74	Rod-like, 50-80 nm (diameter) x 250-300 nm (length)
HGM_#1@TiO ₂ _14.1	101.65	89.23	104.26	100.41	3.71	Rod-like, 130-140 nm (diameter) x 450-650 nm (length)
HGM_#1@TiO ₂ _16.3	98.87	75.53	101.20	98.55	3.55	Shell, ~100 nm thick
HGM_#1@TiO ₂ _17.7	95.85	69.09	98.79	95.27	3.52	Shell, ~200 nm thick

FIG. 8A

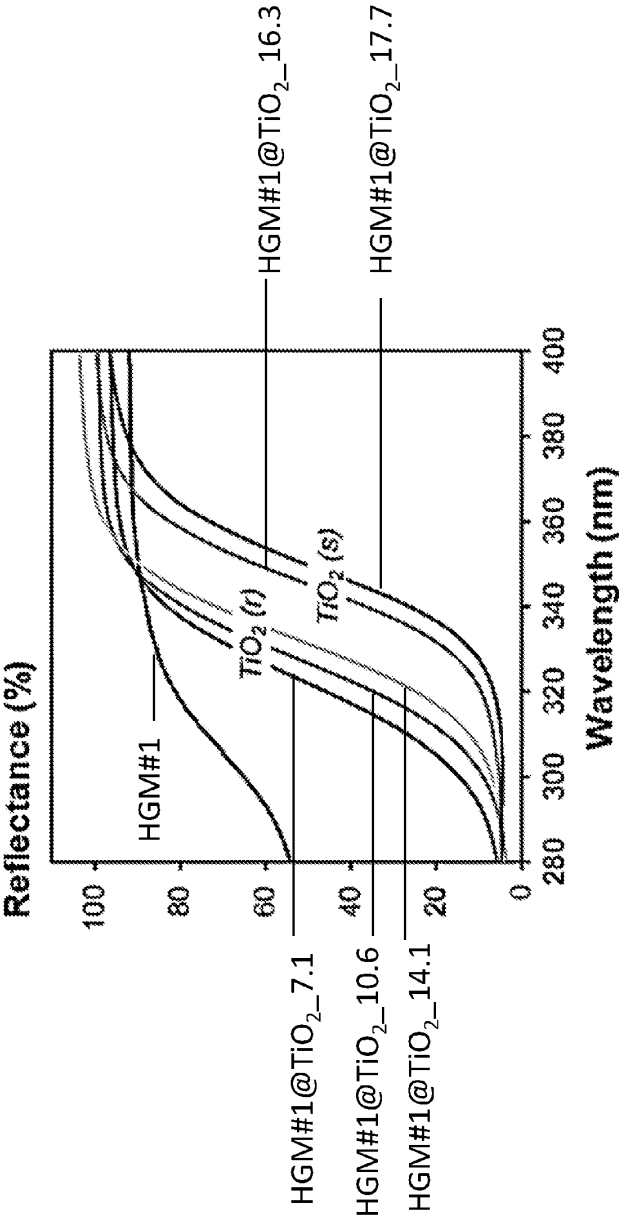


FIG. 8B

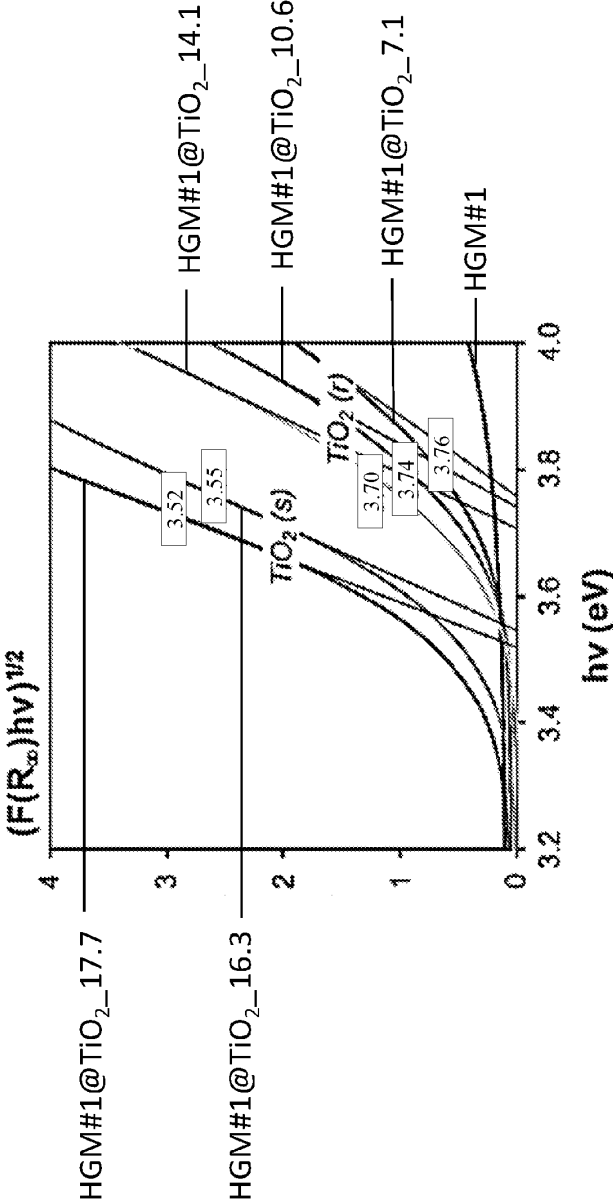


FIG. 9A

S/N	Formulation				Morphology of TiO ₂ on HGMs
	HGM (g)	Ethanol (mL)	Ti(OBu) ₄ /HGM (mmol/m ²)	H ₂ O/Ti(OBu) ₄ (mol/mol)	
HGM #1@TiO ₂ 7.1	0.6	72	7.1	1.9	Rod-like
HGM #1@TiO ₂ 10.6	0.6	72	10.6	1.9	Rod-like
HGM #1@TiO ₂ 14.1	0.6	72	14.1	1.9	Rod-like
HGM #1@TiO ₂ 16.3	0.6	72	16.3	1.9	Shell
HGM #1@TiO ₂ 17.7	0.6	72	17.7	1.9	Shell

FIG. 9B

S/N	Formulation				Morphology of TiO ₂ on HGMs	
	HGM (g)	Ethanol (mL)	Ti(OBu) ₄ /HGM (mmol/m ²)	H ₂ O/Ti(OBu) ₄ (mol/mol)		
HGM #2@TiO ₂	11.7	0.6	72	11.7	1.9	Rod-like
HGM #2@TiO ₂	15.5	0.6	72	15.5	1.9	Shell
HGM #2@TiO ₂	19.4	0.6	72	19.4	1.9	Shell

FIG. 9C

S/N	Formulation				Morphology of TiO ₂ on HGMs
	HGM (g)	Ethanol (mL)	Ti(OBu) ₄ /HGM (mmol/m ²)	H ₂ O/Ti(OBu) ₄ (mol/mol)	
HGM #3@TiO ₂ 9.9	0.6	72	9.9	1.9	Rod-like
HGM #3@TiO ₂ 14.9	0.6	72	14.9	1.9	Shell
HGM #3@TiO ₂ 19.8	0.6	72	19.8	1.9	Shell