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高相转变温度的离子凝胶电解质基准固态染料敏化太阳电池

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Quasi-Solid-State Dye-Sensitized Solar Cell Fabricated fromIonic Gel Electrolyte with High Gel-to-Solution Transition Temperature

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***N,N'*-1,5-戊二基双月桂酰胺的合成**

^{1}H-NMR($CDCl_3$): 0.88(6H, t, *J*= 6.7 Hz), 1.26 (34H, m), 1.53 (4H, m), 1.63 (4H, m), 2.16 (4H, t, *J*= 7.6 Hz), 3.25 (4H, dt, *J*=5.4, 7.0 Hz), 5.62 (H, S3 brs). Anal: Calcd. for $C_{29}H_{58}N_2O_2$: C 74.62; H 12.52; N 6.00. Found: C 74.69; H 12.37; N 6.24.

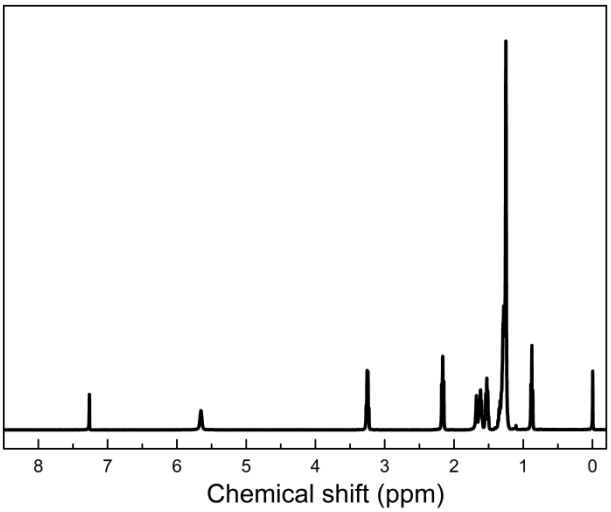

图 S1　*N,N'*-1,5-戊二基双月桂酰胺的 ^{1}H NMR 图谱

Fig.S1　^{1}H NMR chemical shifts of *N,N'*-1,5-pentanediylbis-dodecanamide in Chloroform-*d*

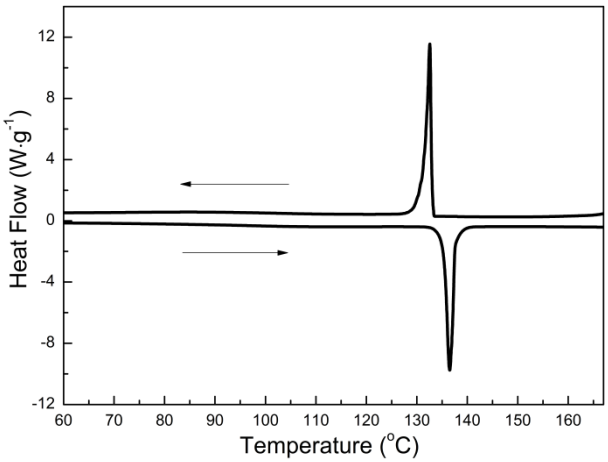

图 S2　*N,N'*-1,5-戊二基双月桂酰胺的差式扫描量热曲线

Fig.S2　Differential scanning calorimetric thermogram of *N,N'*-1,5-pentanediylbis-dodecanamide

1-甲基-3-己基苯并咪唑碘（HMII）的合成

^{1}H NMR(Acetone-*d*6): 0.87 (δH, t, J＝7.0 Hz), 1.30～1.37 (m, 6H), 1.93～1.99 (m, 2H), 4.10 (s, 3H), 4.42 (t, J＝7.3 Hz, 2H), 7.78 (s, 1H), 7.86 (s, 1H), 9.57 (s, 1H).

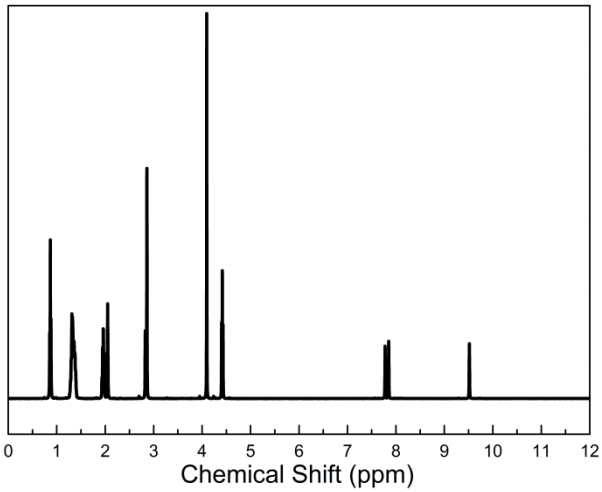

图 S3　HMII 的 ^{1}H NMR 图谱

Fig.S3　^{1}H NMR chemical shifts of HMII in Acetone-*d*6

准固态电池的组装：

利用~45 μm 厚的热熔膜，通过加热封装将纳米 TiO_2 光阳极与对电极封装成夹心结构。将配制好离子凝胶电解质再次加热至 115 ℃ 并持续搅拌，待胶凝剂完全变为液态后，用移液枪立即移取适量的电解质，迅速通过对电极上预先钻好的小孔注入。之后，将电池放置 1~2 min，待其内部电解质胶凝化后，将小孔用热熔膜与盖玻片加热密封。