Supporting Information

Benzo[a]carbazole-Based Donor- π -Acceptor Type Organic Dyes for Highly Efficient Dye-Sensitized Solar Cells

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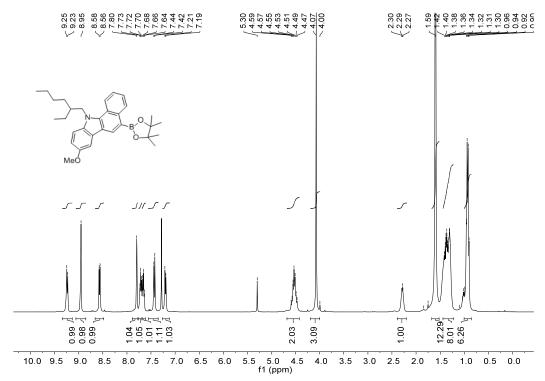


Figure S1. ¹H NMR of compound 4 in CDCl₃.

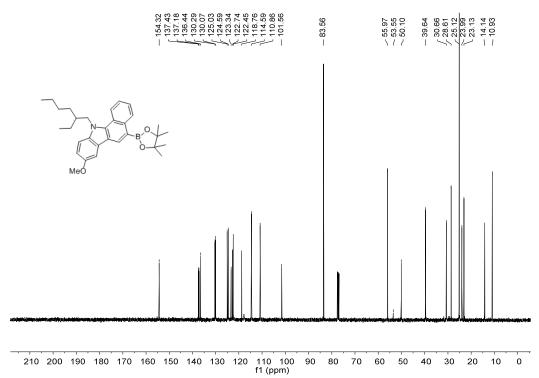


Figure S2. ¹³C NMR of compound 4 in CDCl₃.

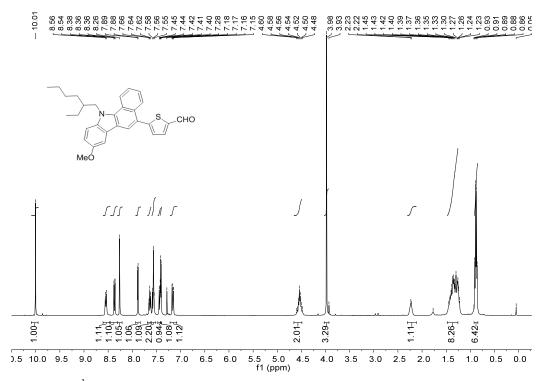


Figure S3. ¹H NMR of compound 5 in CDCl₃.

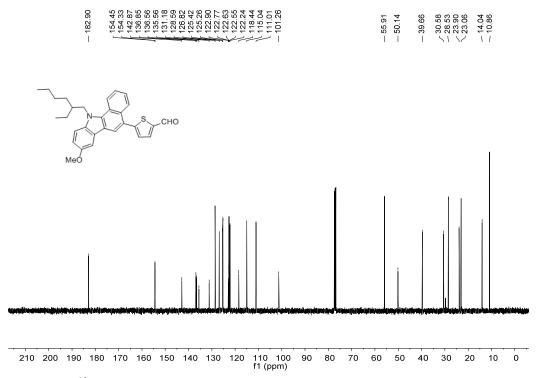


Figure S4. ¹³C NMR of compound 5 in CDCl₃.

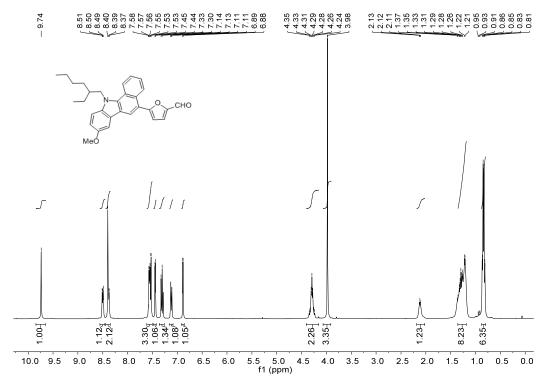


Figure S5. ¹H NMR of compound 6 in CDCl₃.

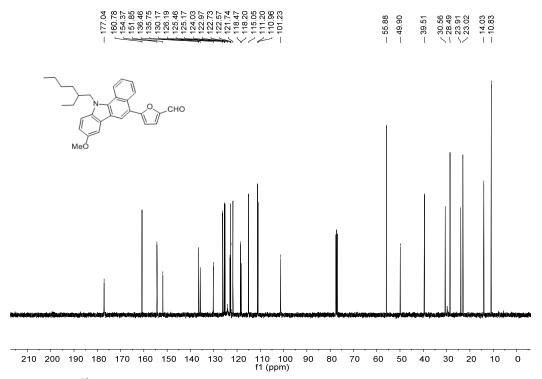


Figure S6. ¹³C NMR of compound 6 in CDCl₃.

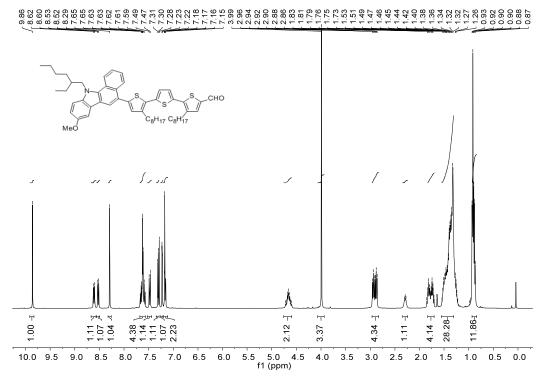


Figure S7. ¹H NMR of compound 7 in CDCl₃.

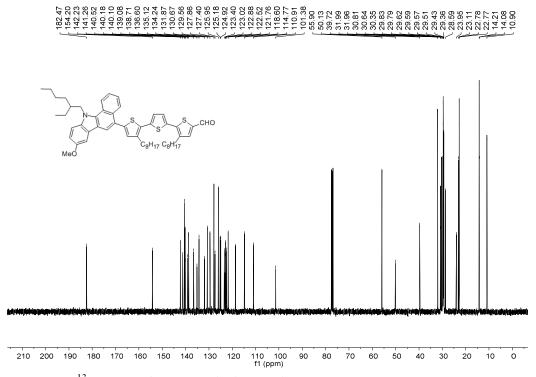


Figure S8. ¹³C NMR of compound 7 in CDCl₃.

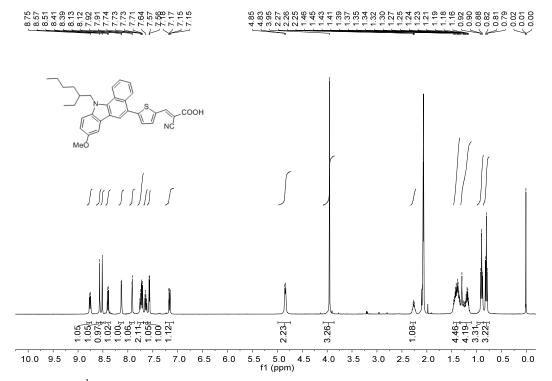


Figure S9. 1 H NMR of JY21 in acetone- d_6 .

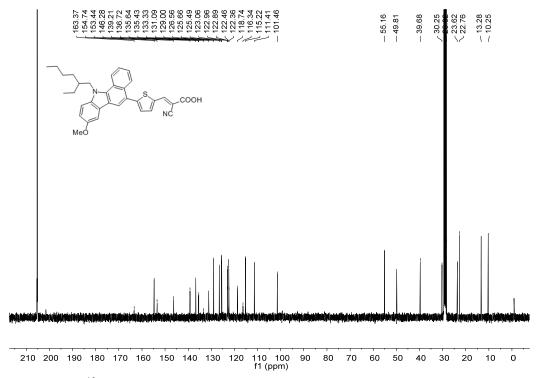


Figure S10. 13 C NMR of **JY21** in acetone- d_6 .

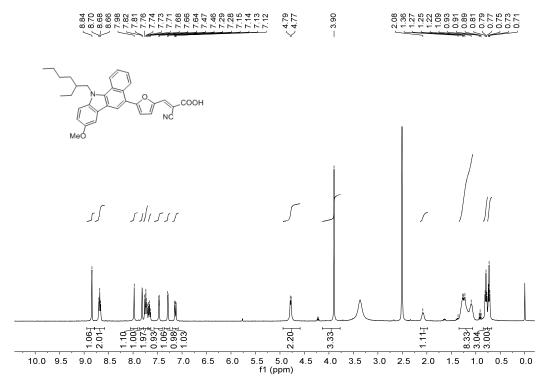


Figure S11. ¹H NMR of JY22 in DMSO-*d*6.

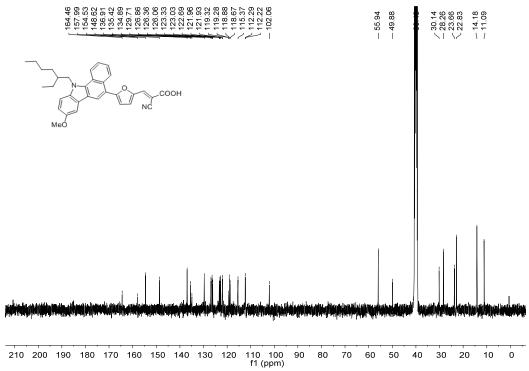


Figure S12. ¹³C NMR of **JY22** in DMSO-*d*6.

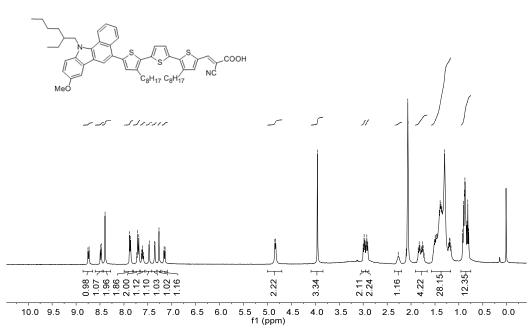


Figure S13. ¹H NMR of JY23 in acetone- d_6 .

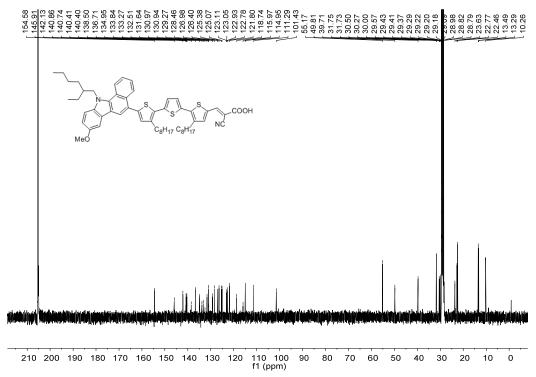


Figure S14. 13 C NMR of **JY23** in acetone- d_6 .