Electronic Supplementary Information

A Resonance Rayleigh Light Scattering Detection of DNA Hybridization Based on Interaction between DNA and Surfactants

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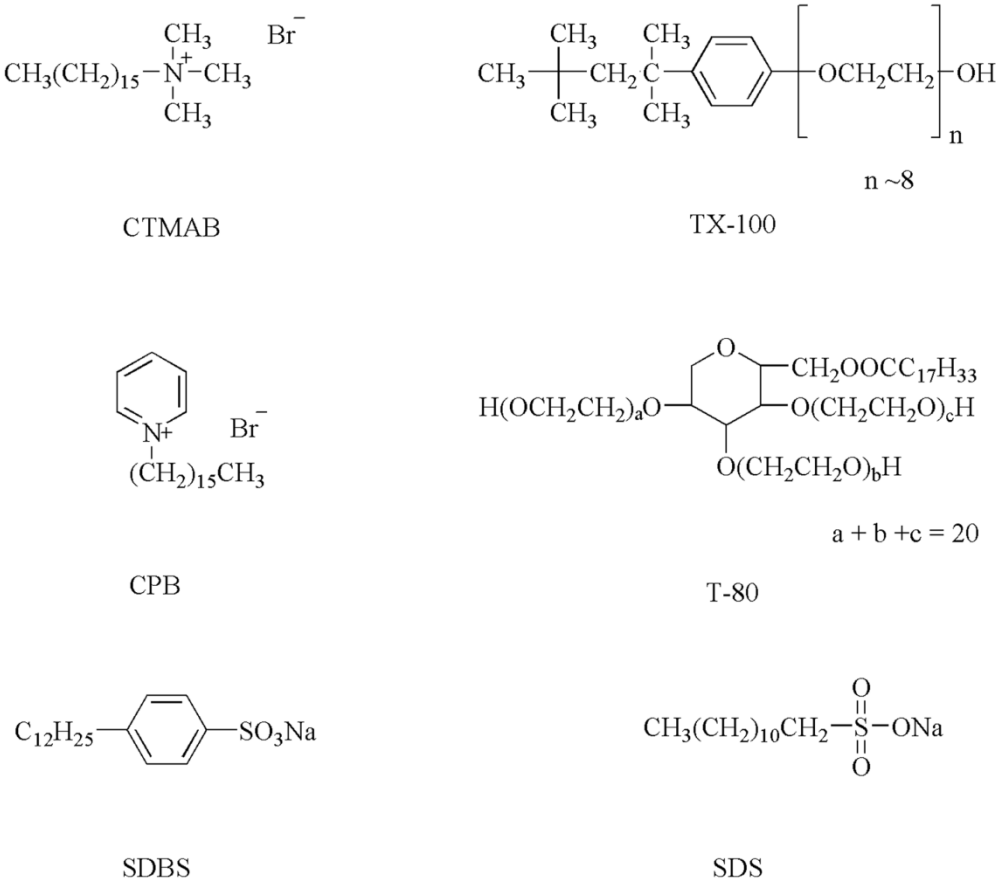


Fig.S1 The Molecular structure of six surfactants

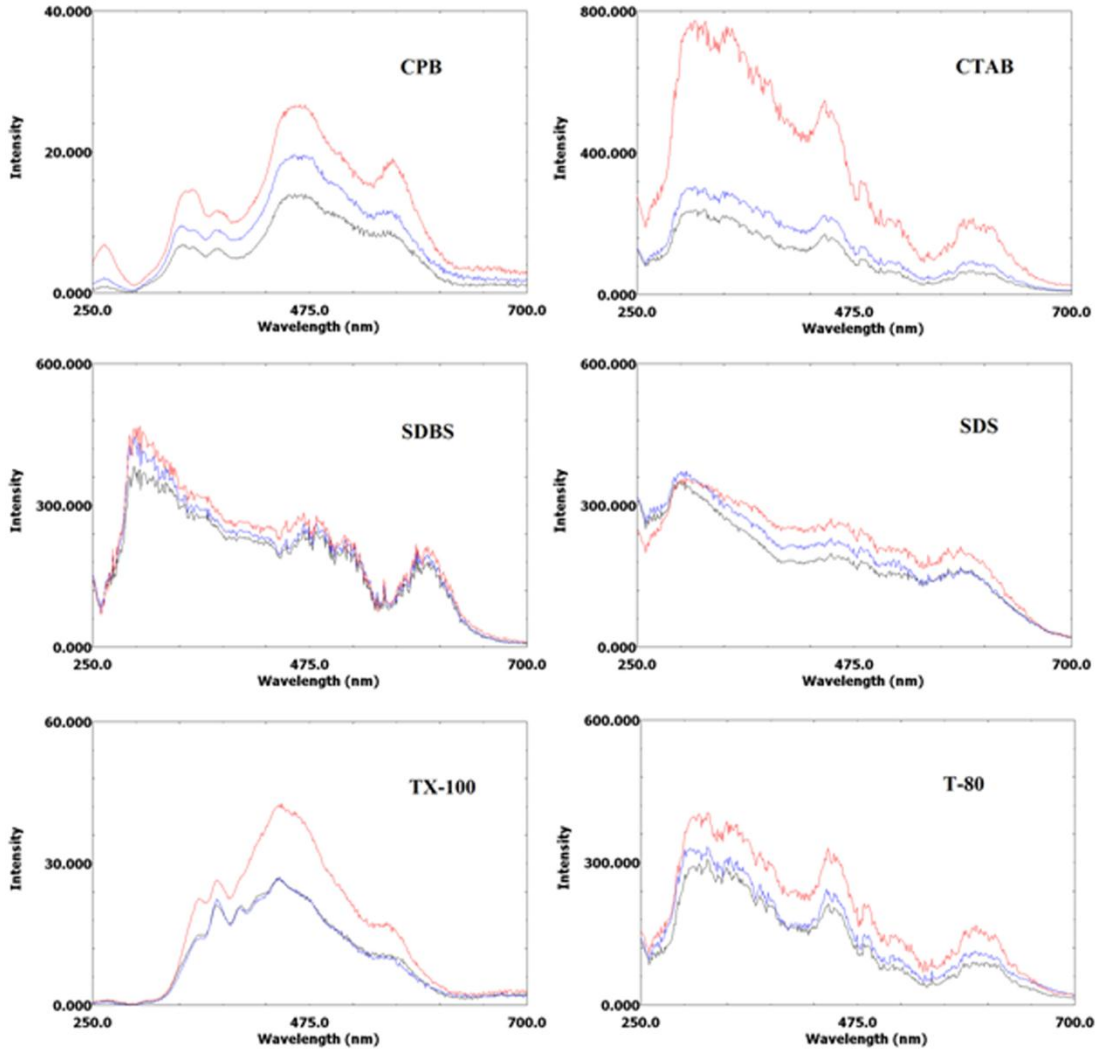


Fig.S2 RRS spectra properties of the interaction of P1 and dsDNA with six surfactants. Surfactants (Black curve), P1-surfactants (Blue curve), dsDNA-surfactants (Red curve). Condition: $C_{Surfactants}$ 4.0×10^{-5} mol L^{-1}, $C_{P1,\ T1}$ 2.0×10^{-7} mol L^{-1}, pH 7.2

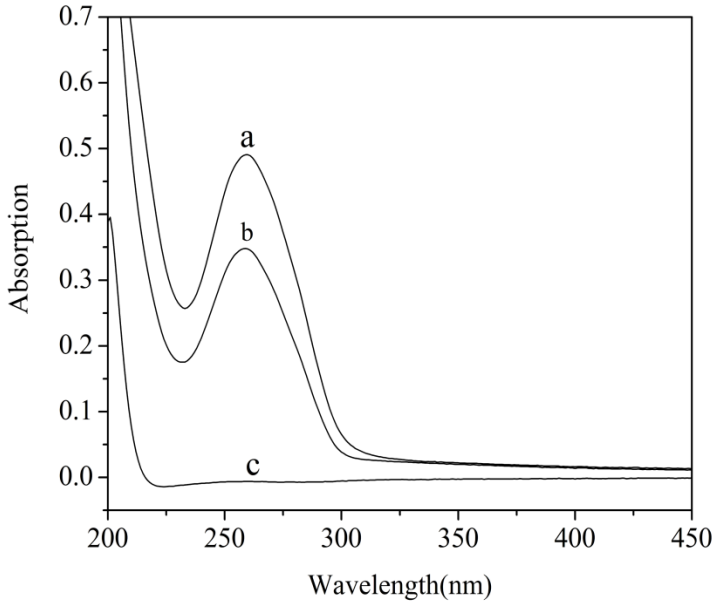


Fig.S3 UV-vis spectra of CTAB-DNA complex. dsDNA (a), CTAB-dsDNA (b), CTAB (c). Condition: C_{CTAB} 4.0×10^{-5} mol L^{-1}, C_{P1} 6.0×10^{-5} mol L^{-1}, C_{dsDNA} 6.0×10^{-5} mol L^{-1}, pH 7.2.

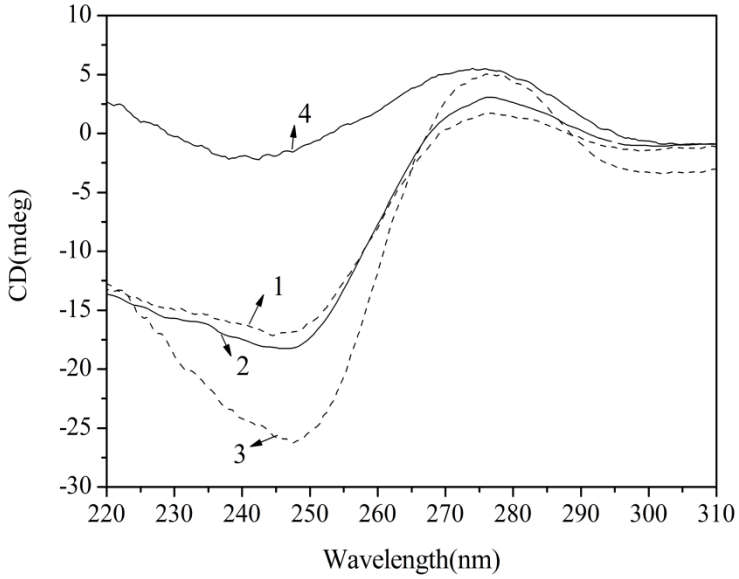


Fig.S4 The CD spectra of bindings of P1 and dsDNA with CTAB. P1 (1), dsDNA (2), CTAB–P1 (3), CTAB-dsDNA (4). Condition: C_{CTAB} 1.0×10^{-5} mol L^{-1}, C_{P1} 1.0×10^{-5} mol L^{-1}, C_{dsDNA} 1.0×10^{-5}mol L^{-1}, pH 7.2.

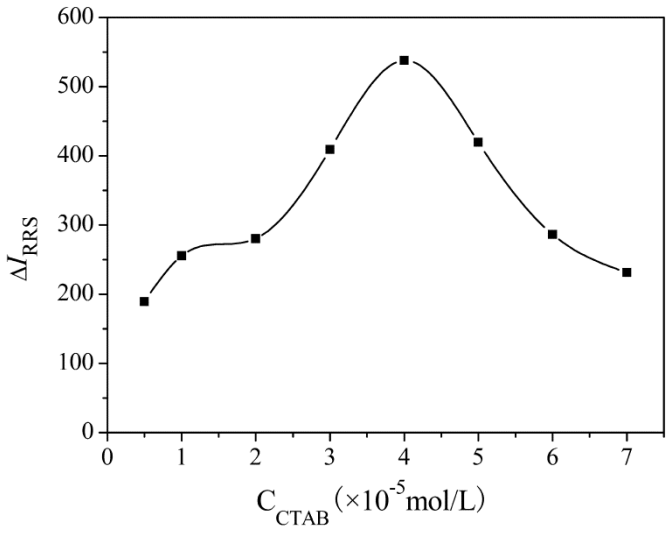


Fig.S5(a) The effect of CTAB concentration on RRS intensity of CTAB-dsDNA system. Conditions: C_{dsDNA} 2×10^{-7}mol L^{-1}, pH 7.2, 42℃.

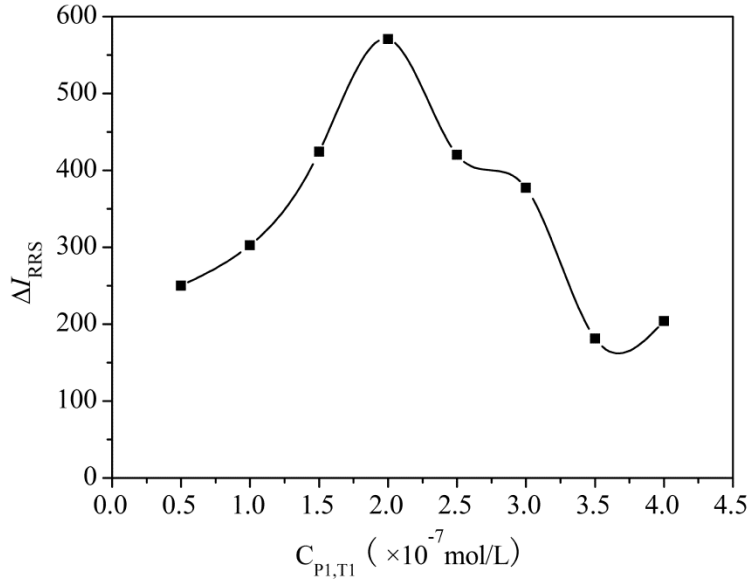


Fig.S5(b) The effect of P1 and T1 concentration on RRS intensity of CTAB-dsDNA system. Conditions: C_{CTAB} 4×10^{-5}mol L^{-1}; pH 7.2, 42℃.

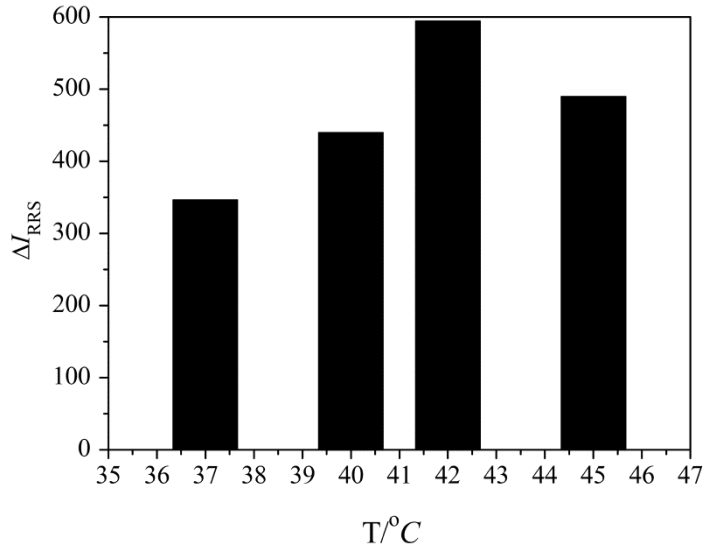


Fig.S5(c) The effect of hybridization incubation temperature on RRS intensity of CTAB-dsDNA. Conditions: C_{CTAB} 4×10^{-5}mol L^{-1}, C_{dsDNA} 2×10^{-7}mol L^{-1}, pH 7.2.

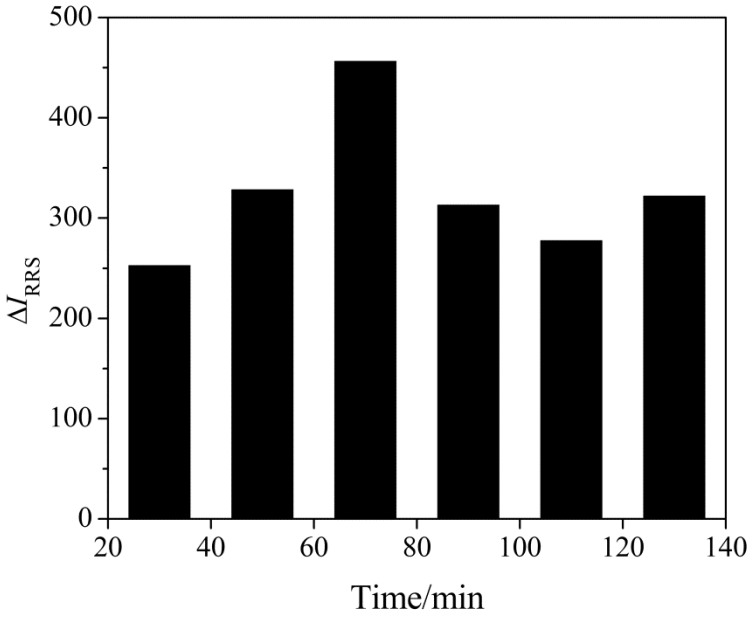


Fig.S5(d) The effect of hybridization incubation time on RRS intensity of

CTAB-dsDNA system. Conditions: C_{CTAB} 4×10^{-5}mol L^{-1}, C_{dsDNA} 2×10^{-7}mol L^{-1}, pH 7.2, 42℃.

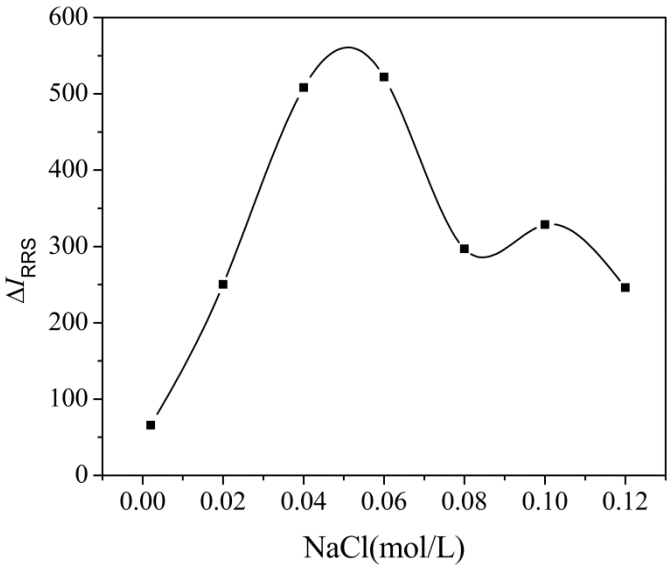


Fig.S5(e) The effect of NaCl concentration on RRS intensity of CTAB-dsDNA system. Conditions: C_{CTAB} 4×10^{-5} mol L^{-1}, C_{dsDNA} 2×10^{-7} mol L^{-1}, C_{MgCl_2} 0.030 mol L^{-1}, pH 7.2, 42℃.

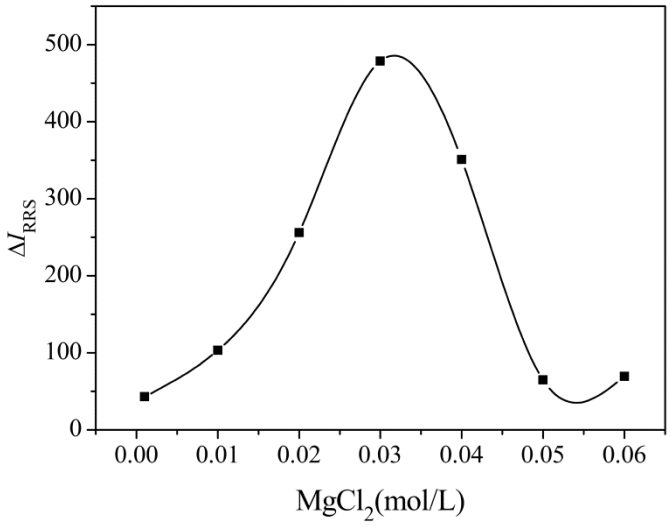
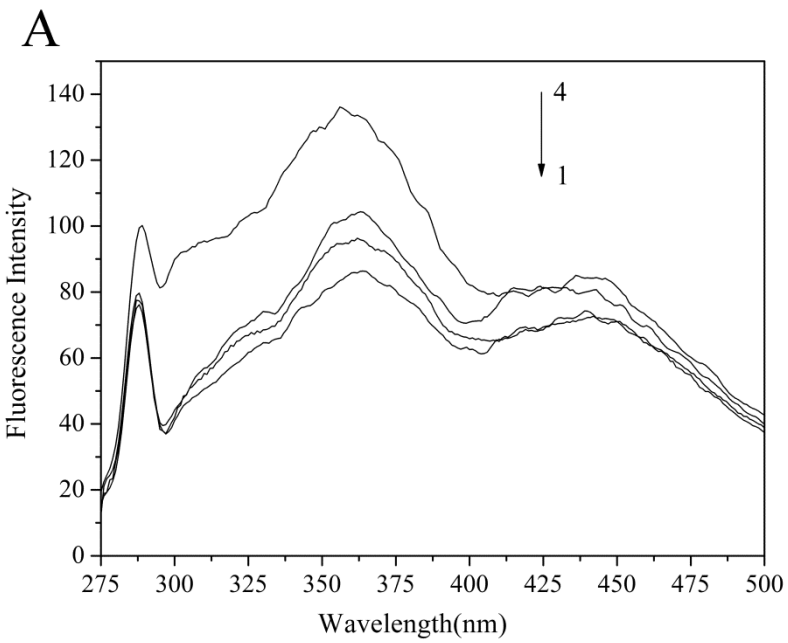


Fig.S5(f) The effect of $MgCl_2$ concentration on RRS intensity of CTAB-dsDNA system.

Conditions: C_{CTAB} 4×10^{-5} mol L^{-1}; C_{dsDNA} 2×10^{-7} mol L^{-1}; C_{NaCl} 0.060 mol L^{-1}, pH 7.2, 42℃.



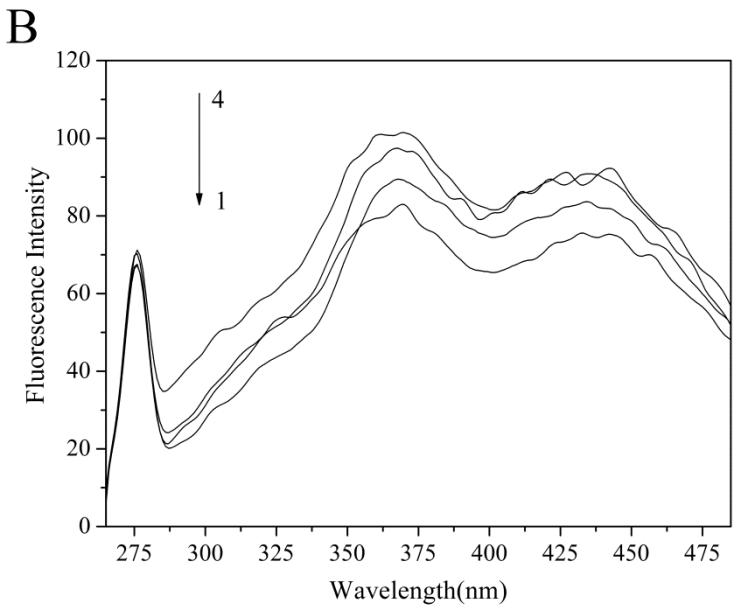


Fig.S6 The fluorescence spectra of characteristic sequence with CTAB. (A) Curve 1: CTAB, Curve 2: CTAB-Py, Curve 3: CTAB–Py with MTy, Curve 4: CTAB-Py with Ty. (B) Curve 1: CTAB, Curve 2: CTAB-Pc, Curve 3: CTAB–Pc with MTc, Curve 4: CTAB-Pc with Tc. Condition: C_{CTAB} 2.0×10^{-7} mol L^{-1}, C_{Py} 1.0×10^{-7} mol L^{-1}, C_{Ty} 1×10^{-7} mol L^{-1}, C_{Pc} 1.0×10^{-7} mol L^{-1}, C_{Tc} 1×10^{-7} mol L^{-1}, pH 7.2.

Table S1 The effect of buffer

Kind of buffer	Tris-HCl	PBS	H_2BO_3-$Na_2B_4O_7$	Critic acid-Na_2HPO_4
ΔI_{RRS} (%)	100	84.2	76.3	56.8

Note: all the buffers were adjusted in the pH range of 7.0-7.4.