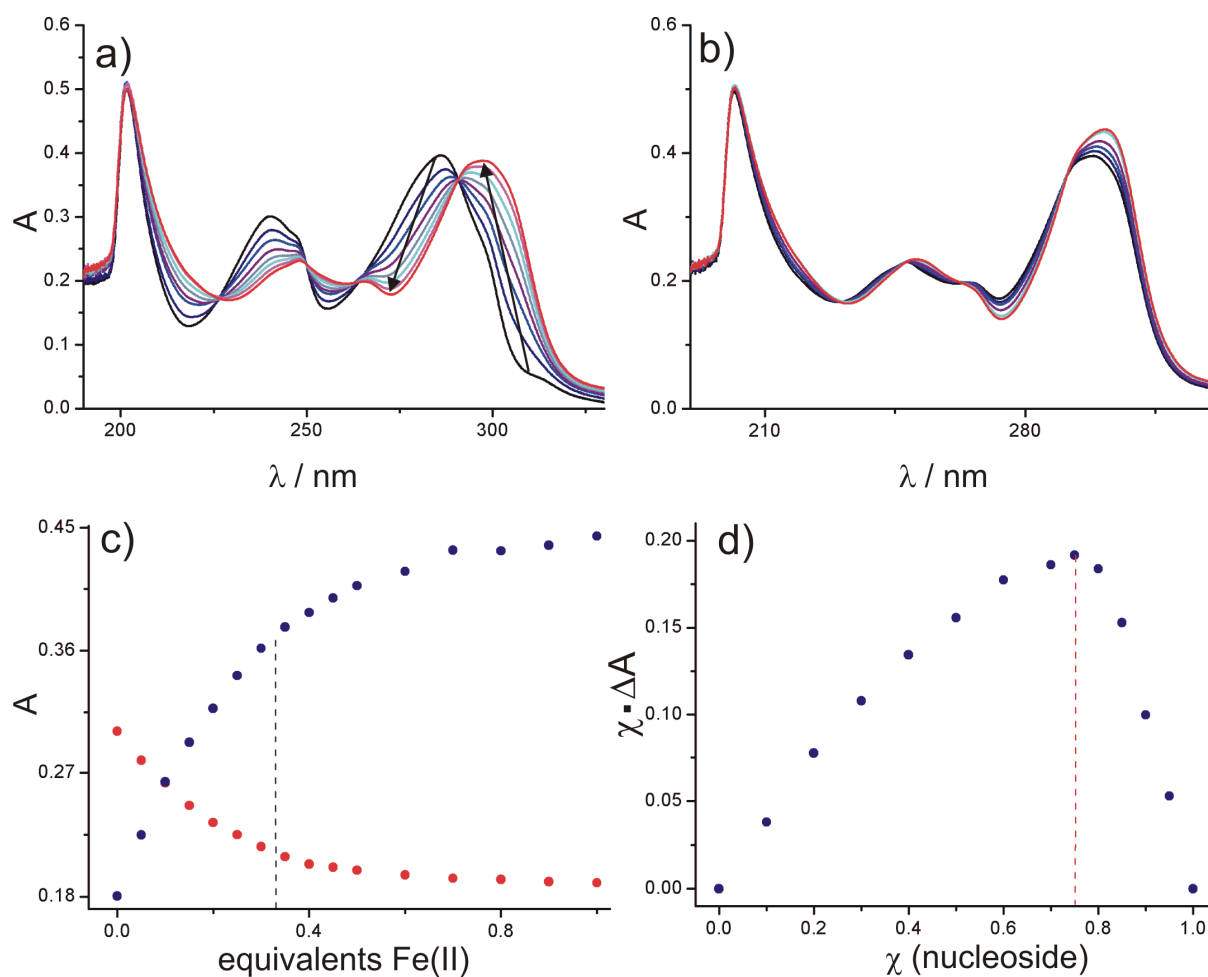


Metal-mediated aggregation of DNA comprising 2,2'-
bipyridine nucleoside, an asymmetrically substituted chiral
bidentate ligand

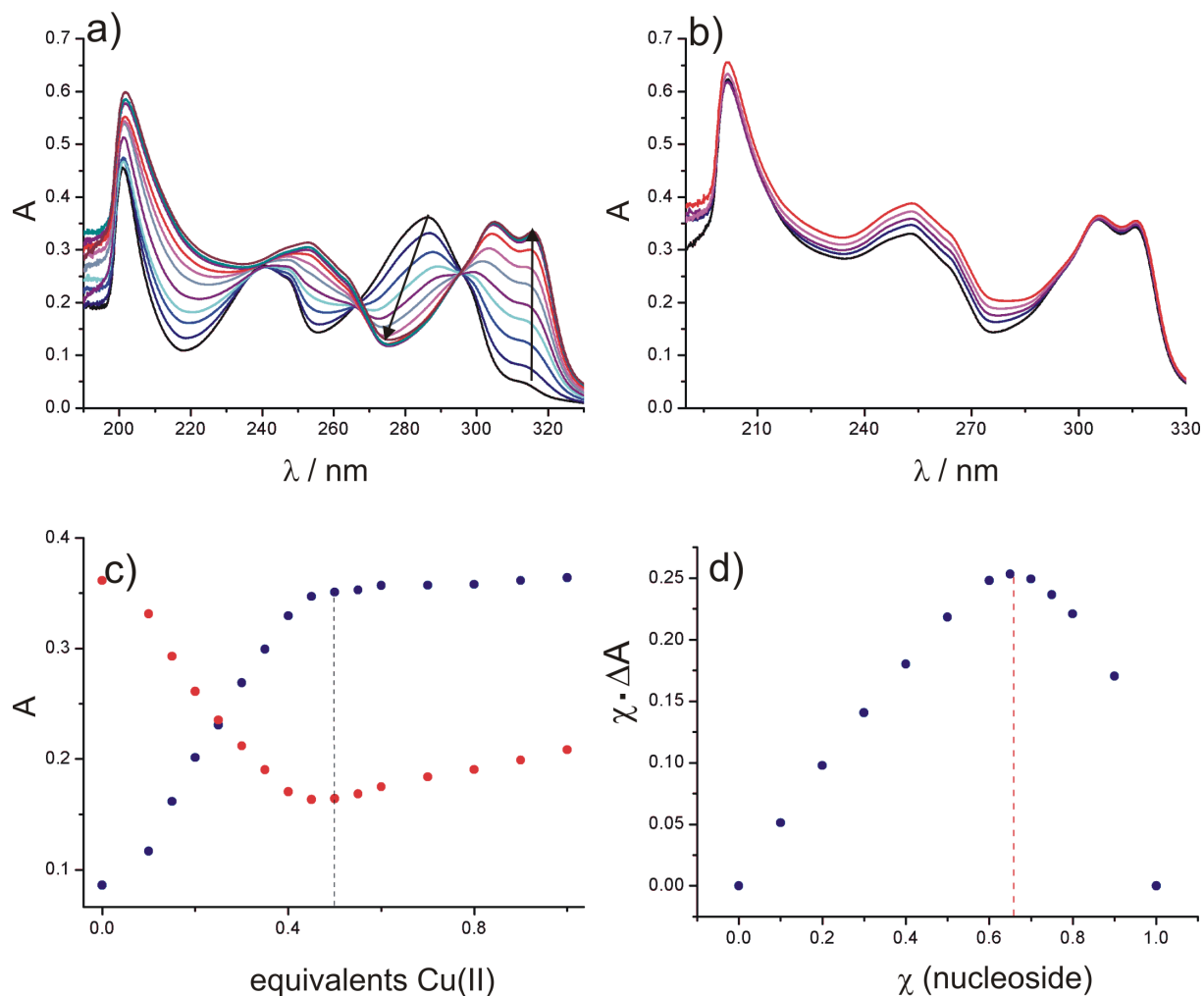
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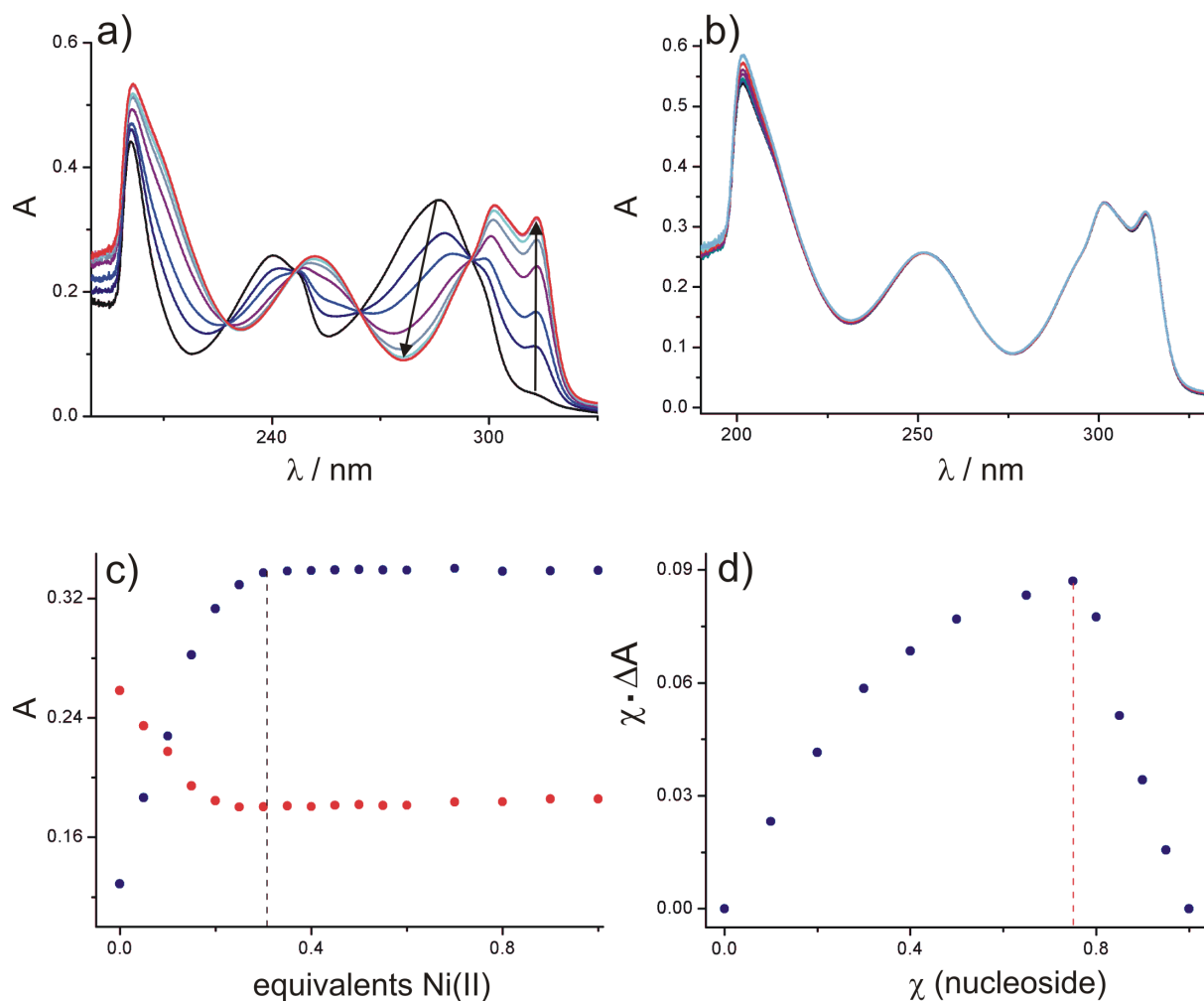
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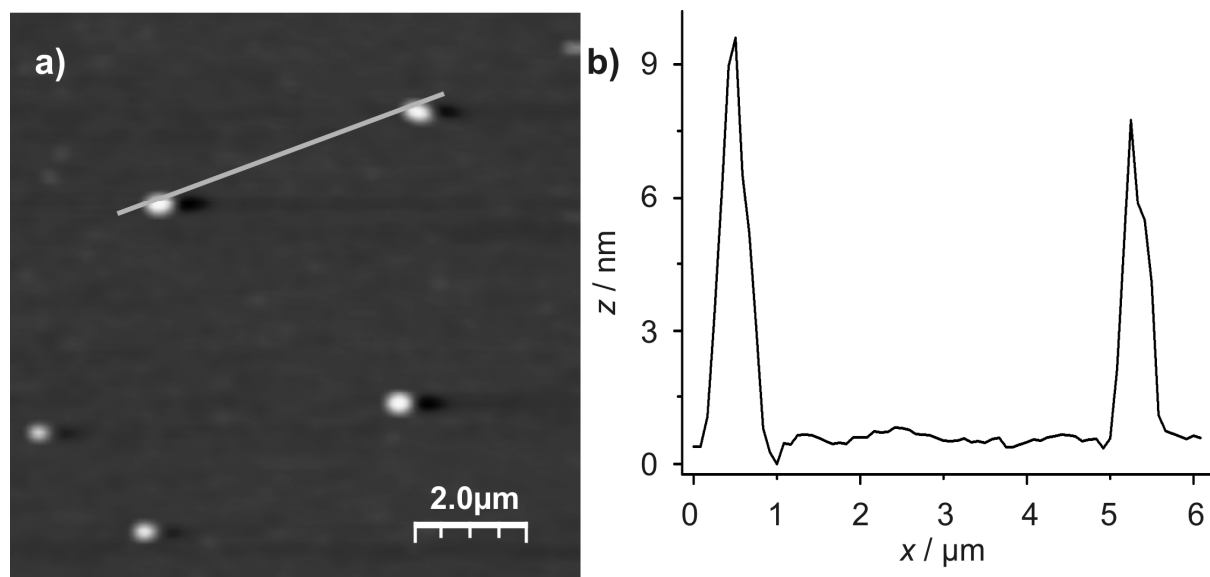
Titration of 5-methyl-2,2'-bipyridine nucleoside with FeSO₄ in MeOH as followed by UV spectroscopy. a) UV spectra upon the addition of 0.00 – 0.35 equiv. of iron(II). The absorption changes are indicated by arrows. b) UV spectra upon the addition of 0.40 – 1.0 equiv. of iron(II). c) Plot of absorption at 240 nm (●) and 301 nm (●), respectively, against the amount of added iron(II). d) Job plot based on the UV absorption at 240 nm, showing a maximum at a molar fraction of 0.75. This clearly indicates the formation of a 3:1 complex between the nucleoside and the metal ion.



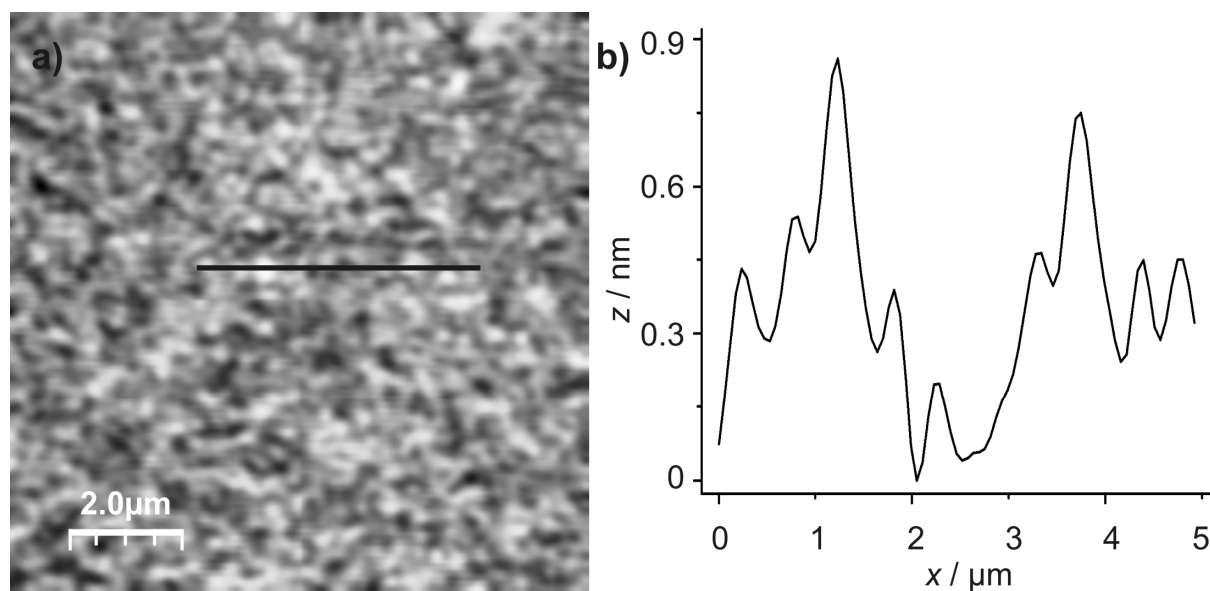
Titration of 5-methyl-2,2'-bipyridine nucleoside with CuCl_2 in MeOH as followed by UV spectroscopy. a) UV spectra upon the addition of 0.00 – 0.50 equiv. of copper(II). The absorption changes are indicated by arrows. b) UV spectra upon the addition of 0.55 – 1.00 equiv. of copper(II). c) Plot of absorption at 286 nm (●) and 302 nm (●), respectively, against the amount of added copper(II). A distinct change of slope can be observed at 0.50 equiv. of copper(II). d) Job plot based on the UV absorption at 286 nm, showing a maximum at a molar fraction of 0.67. Taken together, these data clearly indicate the formation of a 2:1 complex between the nucleoside and the metal ion.



Titration of 5-methyl-2,2'-bipyridine nucleoside with NiCl_2 in MeOH as followed by UV spectroscopy. a) UV spectra upon the addition of 0.00 – 0.35 equiv. of nickel(II). The absorption changes are indicated by arrows. b) UV spectra upon the addition of 0.40 – 1.00 equiv. of nickel(II). c) Plot of absorption at 240 nm (●) and 302 nm (●), respectively, against the amount of added nickel(II). A distinct change of slope can be observed at 0.33 equiv. of nickel(II). d) Job plot based on the UV absorption at 240 nm, showing a maximum at a molar fraction of 0.75. Taken together, these data clearly indicate the formation of a 3:1 complex between the nucleoside and the metal ion.



a) AFM topographic image of d(XCGCGAATTCGCG) in the presence of copper(II) ($0.67 \mu\text{M}$ oligonucleotide) and b) associated height profile, indicating that the aggregate size directly depends on the oligonucleotide concentration.



a) AFM topographic image of d(XCGCGAATTCGCG) in the presence of nickel(II) ($0.83 \mu\text{M}$ oligonucleotide) and b) associated height profile, indicating monolayer formation also under an increased oligonucleotide concentration.