

Novi dinuklearni Au(III) kompleks: Sinteza, karakterizacija i ispitivanje interakcija sa DNK

Snežana R. Radisavljević¹, Snežana M. Jovanović², Ana S. Đeković-Kesić², Biljana V. Petrović¹
snezana.radisavljevic@pmf.kg.ac.rs

¹University of Kragujevac, Faculty of Science R. Domanovića 12, Kragujevac, Serbia

²University of Kragujevac, Institute for Information Technologies, J. Cvijića bb, Kragujevac, Serbia

Considering that gold(III) complexes are isostructural with platinum(II) complexes, the synthesis, characterization and study of their biological activity were very common in the last period.¹ We have synthesized new dinuclear gold(III) complex with 1,5-naphthyridine as bridging ligand. The structure of this complex was confirmed by different analytical methods (IR, UV-Vis, ¹H NMR, mass analysis, conductometry). The study of the interactions between complex and DNA was performed by UV-Vis spectrophotometry, fluorescence spectroscopy and viscosity measurement.

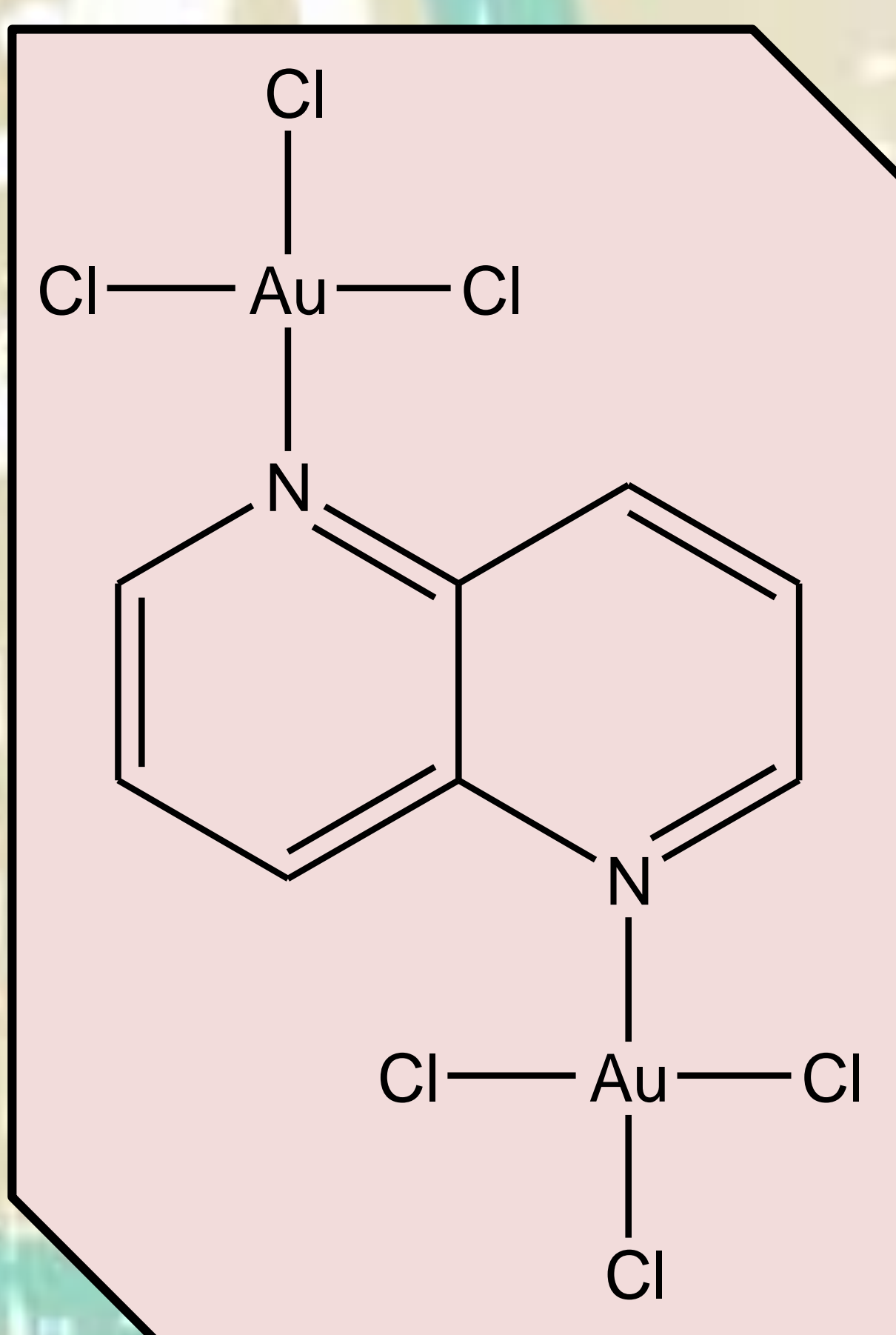


Fig. 1 Structure of investigated complex

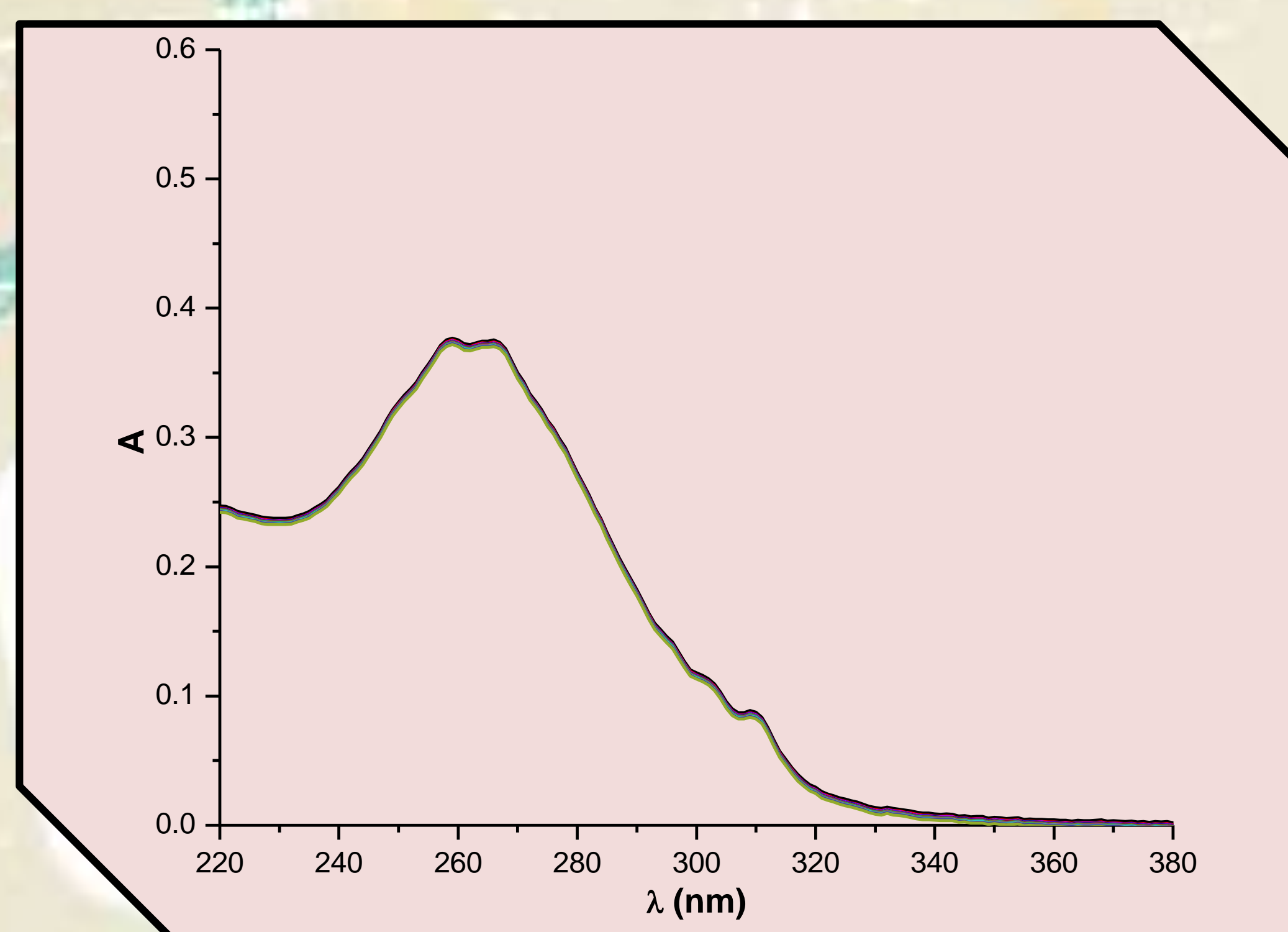


Fig. 2 Stability of complex in PBS over 6 hours.

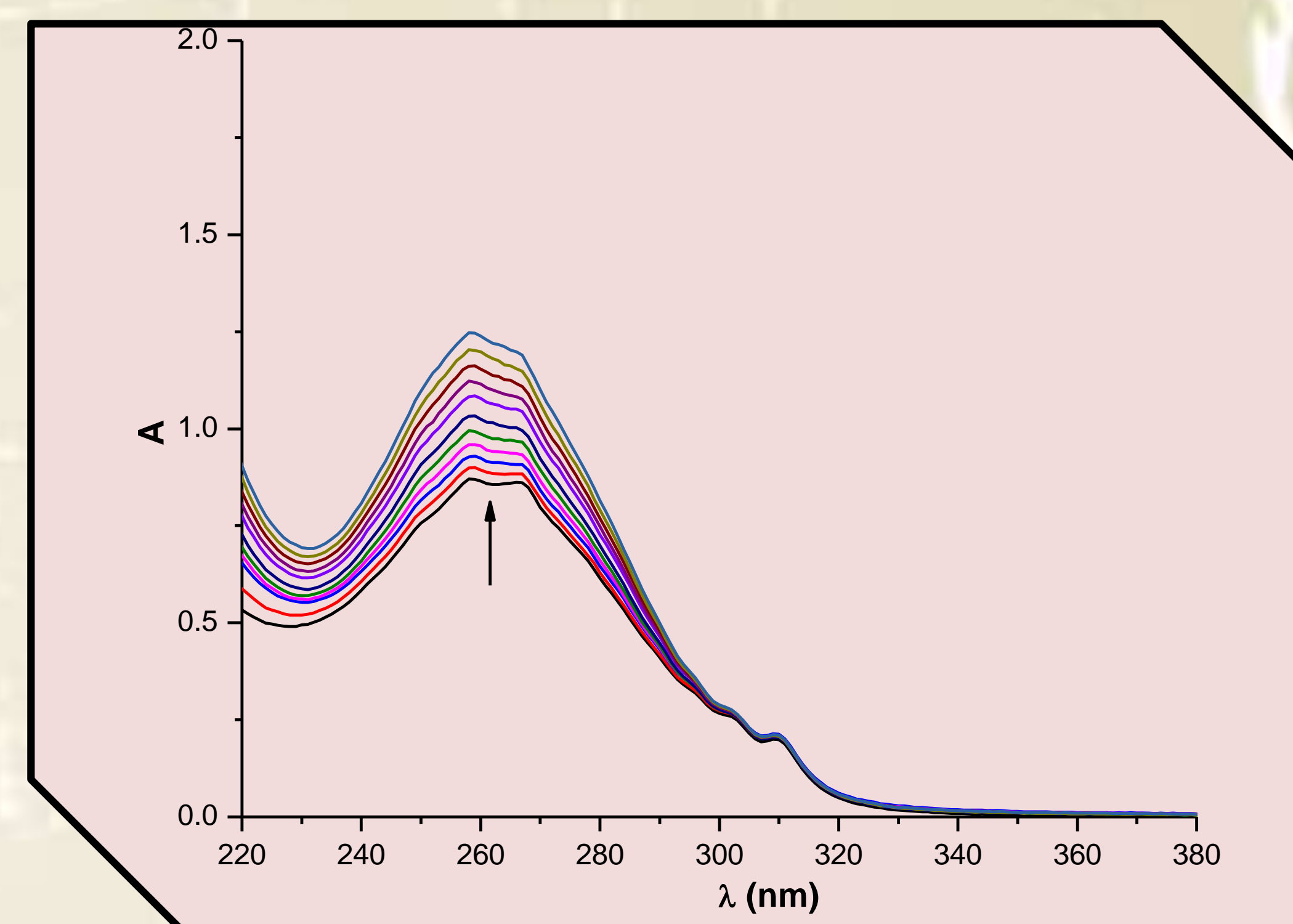


Fig. 3 Absorption spectra of the complex in PBS buffer upon addition of CT-DNA. Arrow shows the change of the absorbance after addition of the increasing concentrations of CT-DNA.

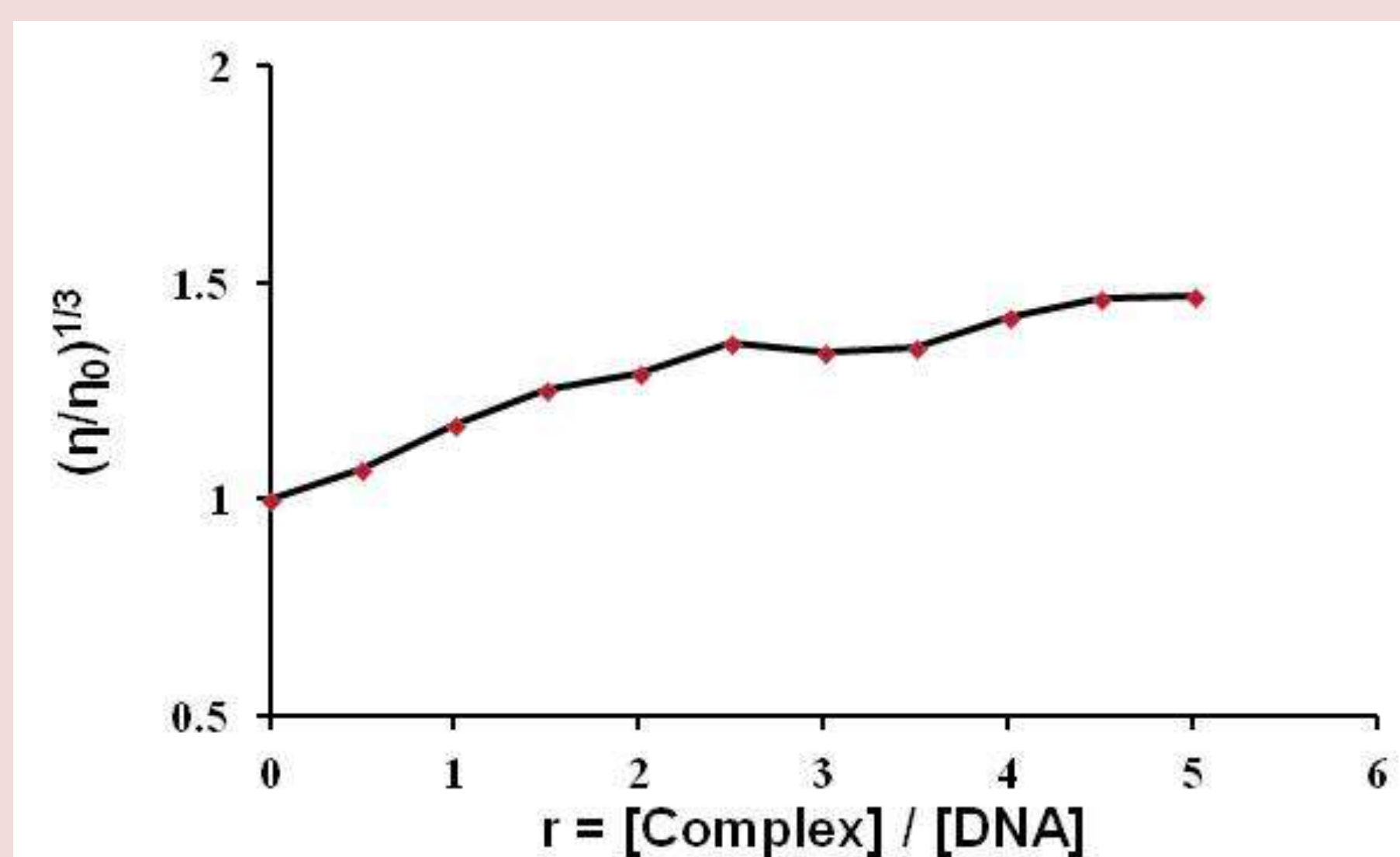


Fig. 5 Relative viscosity $(\eta/\eta_0)^{1/3}$ of CT-DNA (0.013 mM) in buffer (0.01 M PBS, pH=7.4) in the presence of the increasing amounts of Au(III) complex (r).

Table 1 The DNA-binding constant (K_b) and Stern–Volmer constant (K_{sv}) from EB–DNA fluorescence competition experiment.

K_b [M^{-1}] $\times 10^5$	K_{sv} [M^{-1}] $\times 10^4$
1.39 ± 0.02	3.939 ± 0.006

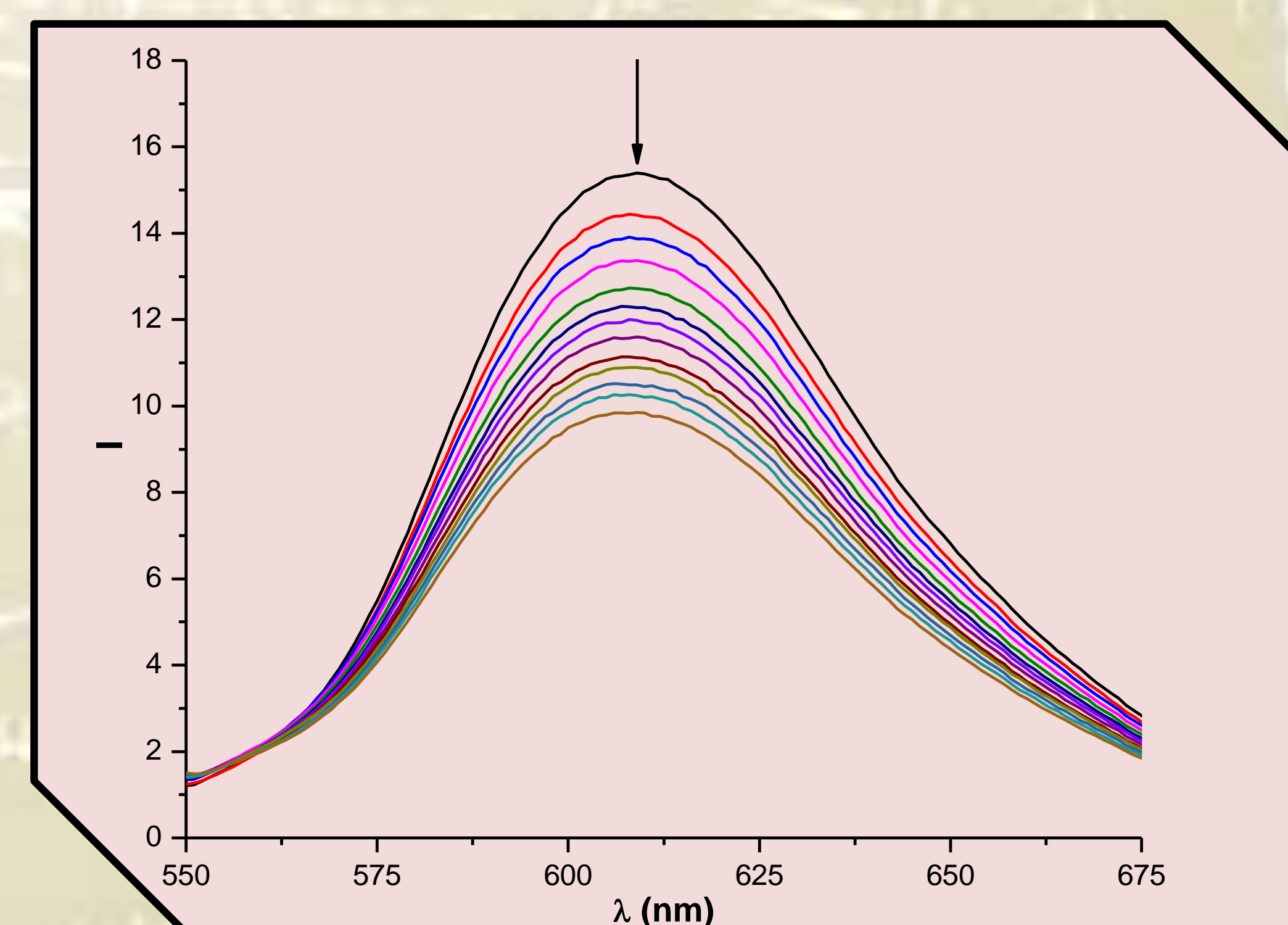


Fig. 4 Emission spectra of EB bound to DNA in the presence of complex. [EB] = 6.73 μ M, [DNA] = 6.73 μ M; [Au] = 1.33 – 13.9 μ M; λ_{ex} = 527 nm. The arrow shows the intensity changes upon increased concentration of complex.

CONCLUSION

Based on the results obtained by UV-Vis spectrophotometry can be concluded that complex binds to DNA. Additionally, according to the results obtained by fluorescence spectroscopy and by viscosity measurement, the covalent binding mode between complex and DNA was confirmed.

References:

1. M. Cini, T. D. Bradshaw, S. Woodward, *Chem. Soc. Rev.*, **2017**, 46, 1040.