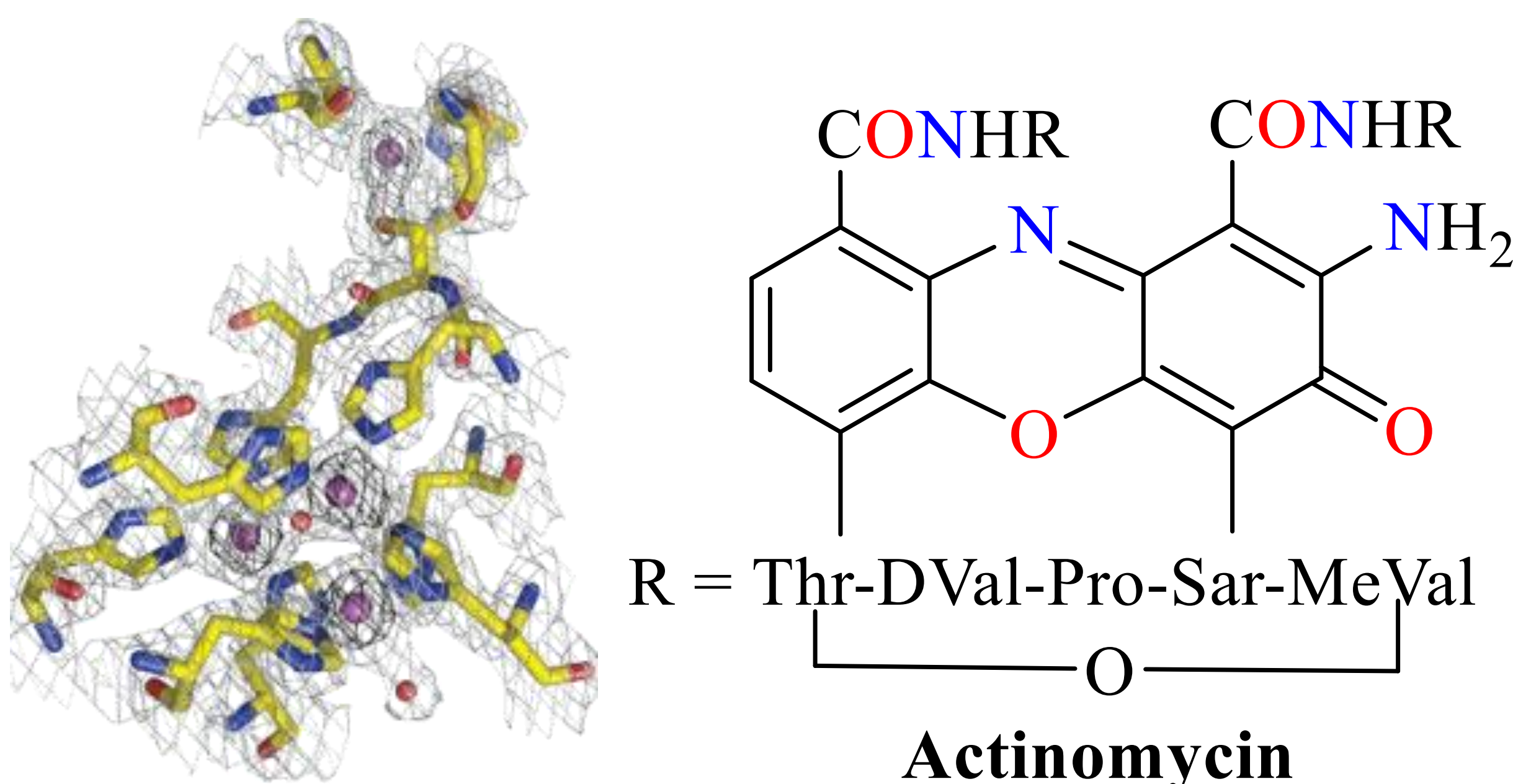


INTRODUCTION/JUSTIFICATION/AIM

Phenoxazinone synthase is a multicopper oxidase enzyme which catalyses two molecules of 2-aminophenol (OAPH) derivatives in the final step of the biosynthesis of some important biomolecules like actinomycins which have been used clinically for the treatment of some cancerous cell such as rhabdomyosarcoma. In view of the scarcity of Phenoxazinone synthase, hence the need for the use of metal complexes that can mimic phenoxazinone synthase. Consequently, Co complexes being cheap and affordable were deployed as phenoxazinone synthase biomimics. Therefore, this research aimed at synthesis of some Co(III) complexes as catalysts that can mimic phenoxazinone synthase behaviour.

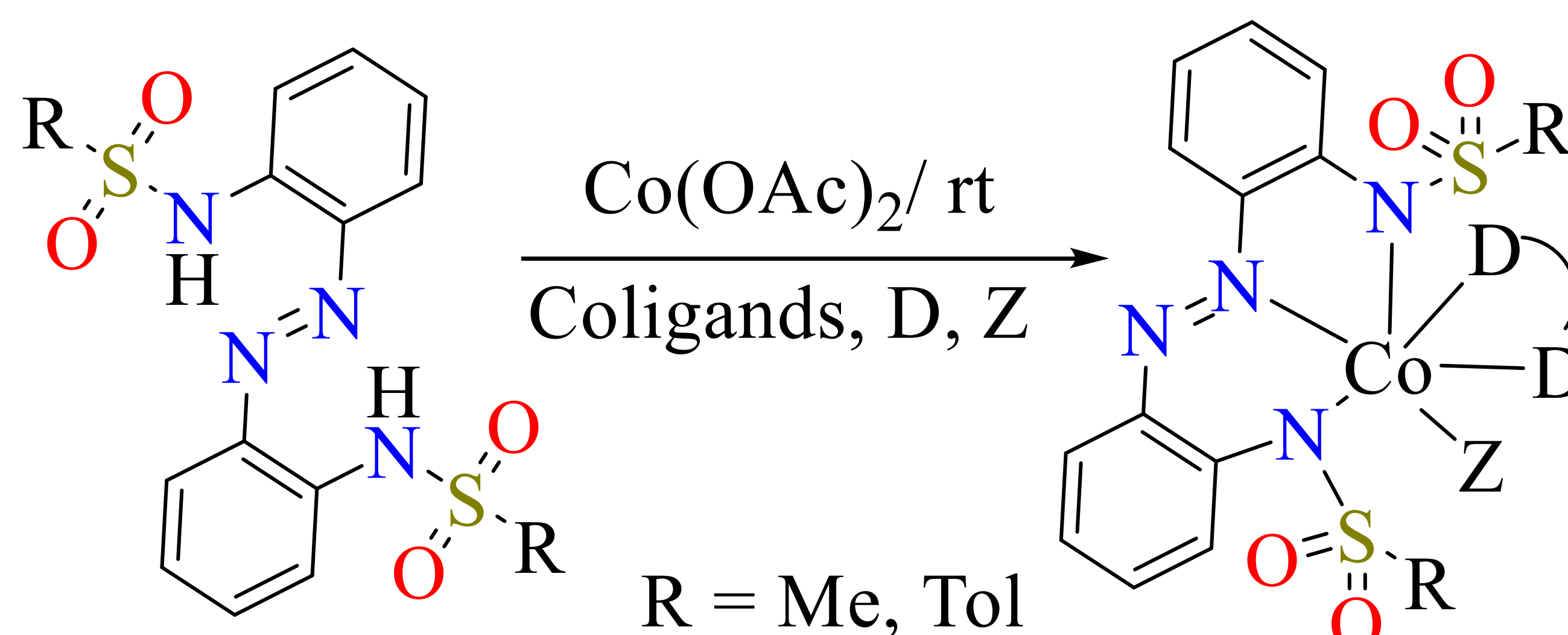


Phenoxazinone synthase showing the Cu centers

EXPERIMENTAL SECTION

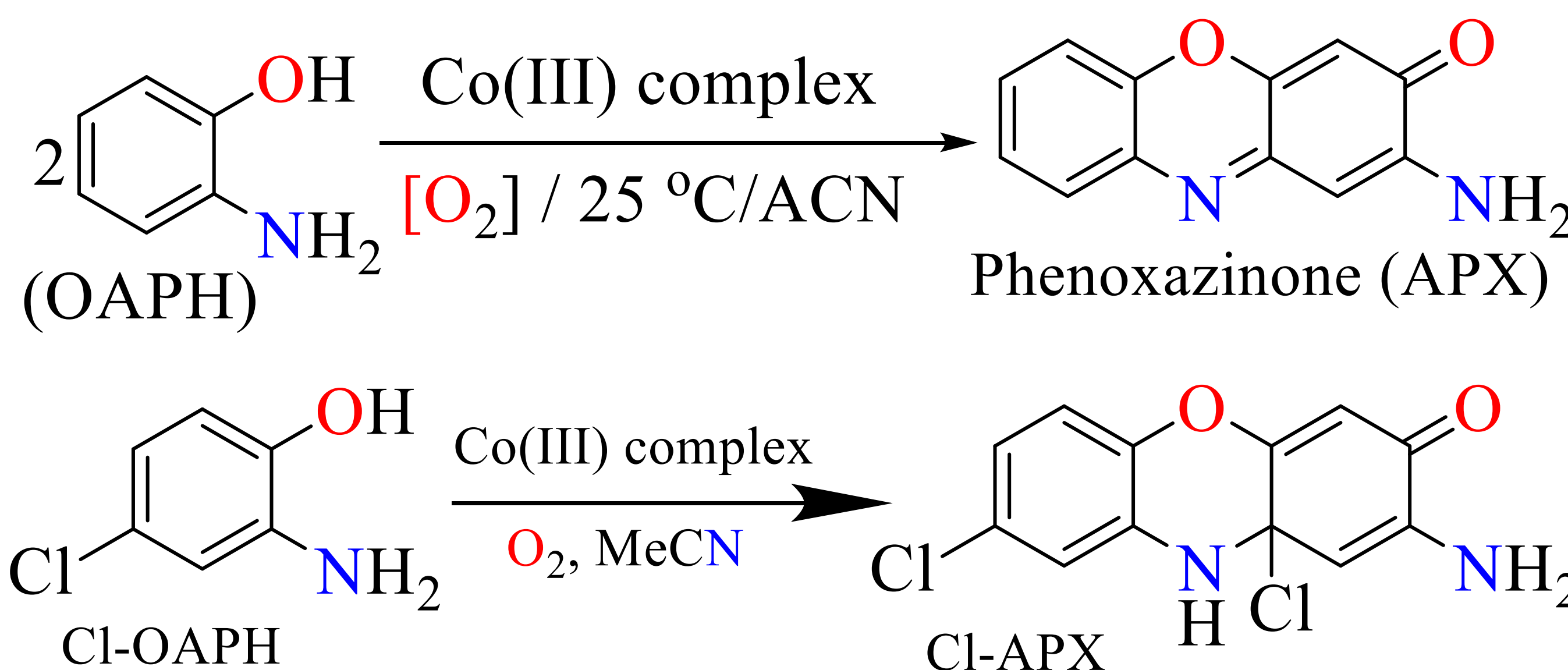
(i) Synthesis of the Co(III) complexes

The Co(III) complexes were obtained from the reaction of the ligands, Co acetate and coligands like water, dmap, bpy



(ii) Synthesis of Phenoxazinone from OAPH

The aerobic oxidation of OAPH in acetonitrile catalysed by the Co(III) complexes gives the phenoxazinone derivatives



RESULTS

Structures of the Co(III) complexes

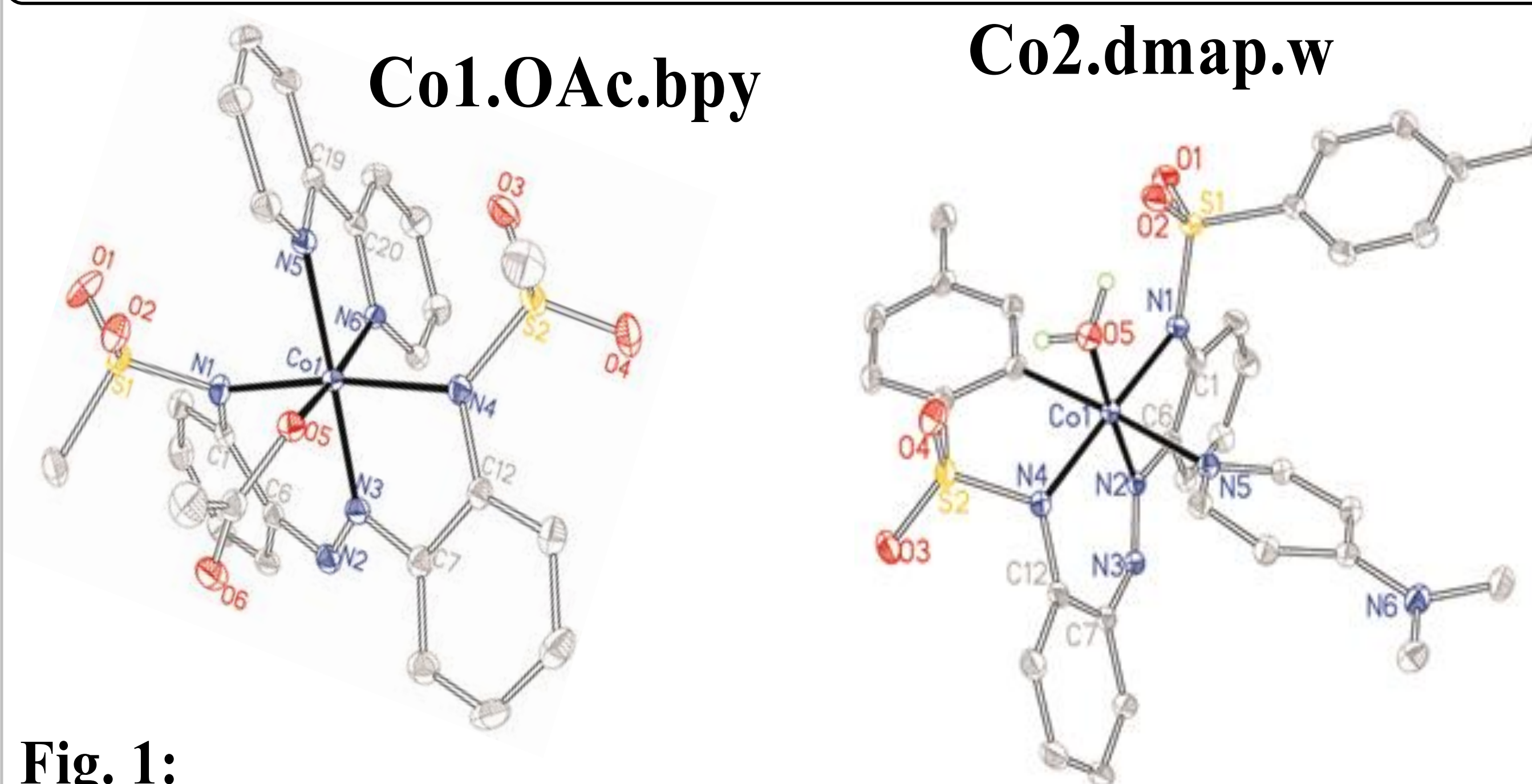


Fig. 1: Stack of UV-vis spectral scans at regular time intervals showing the increasing phenoxazinone chromophore band

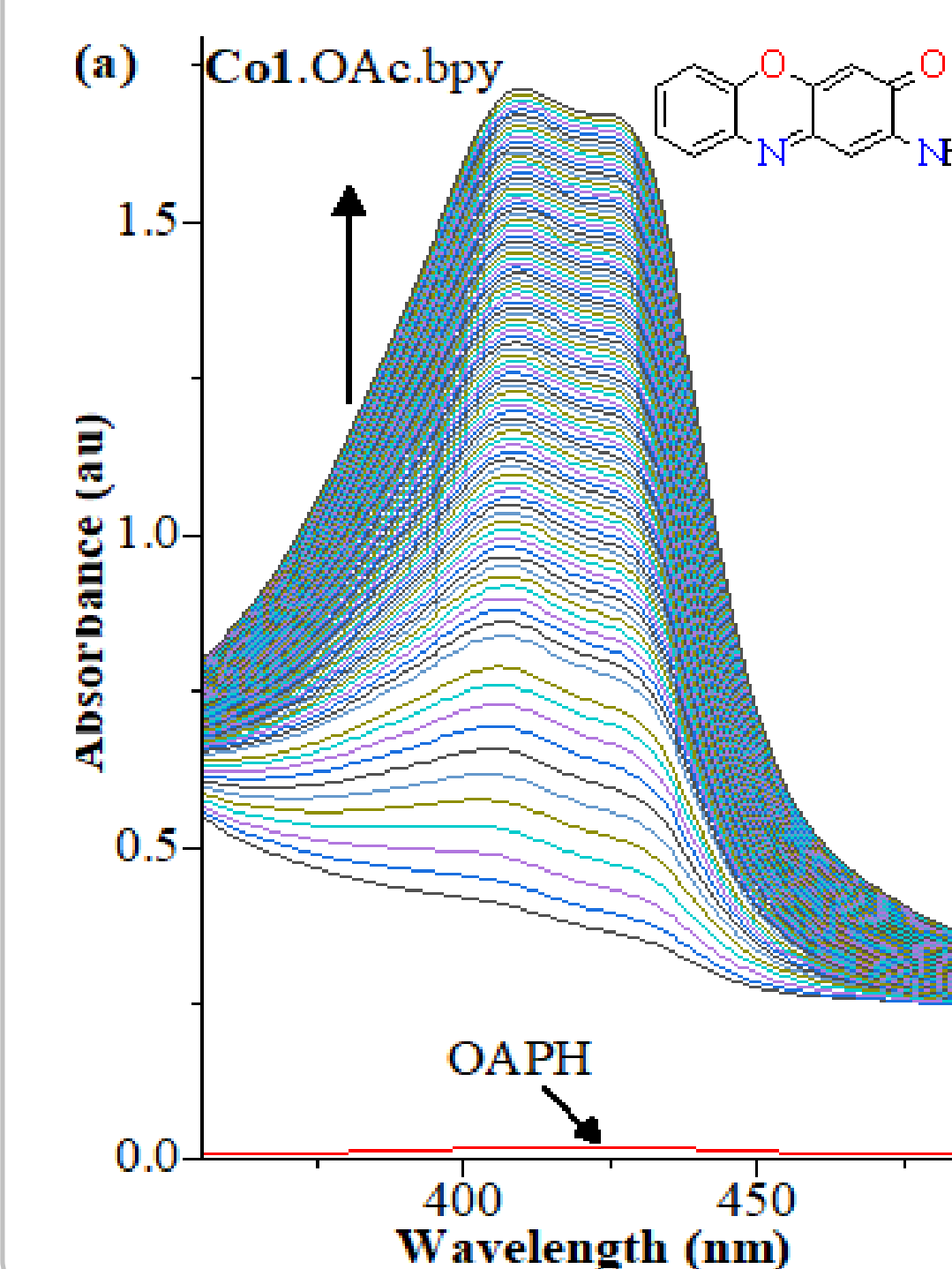
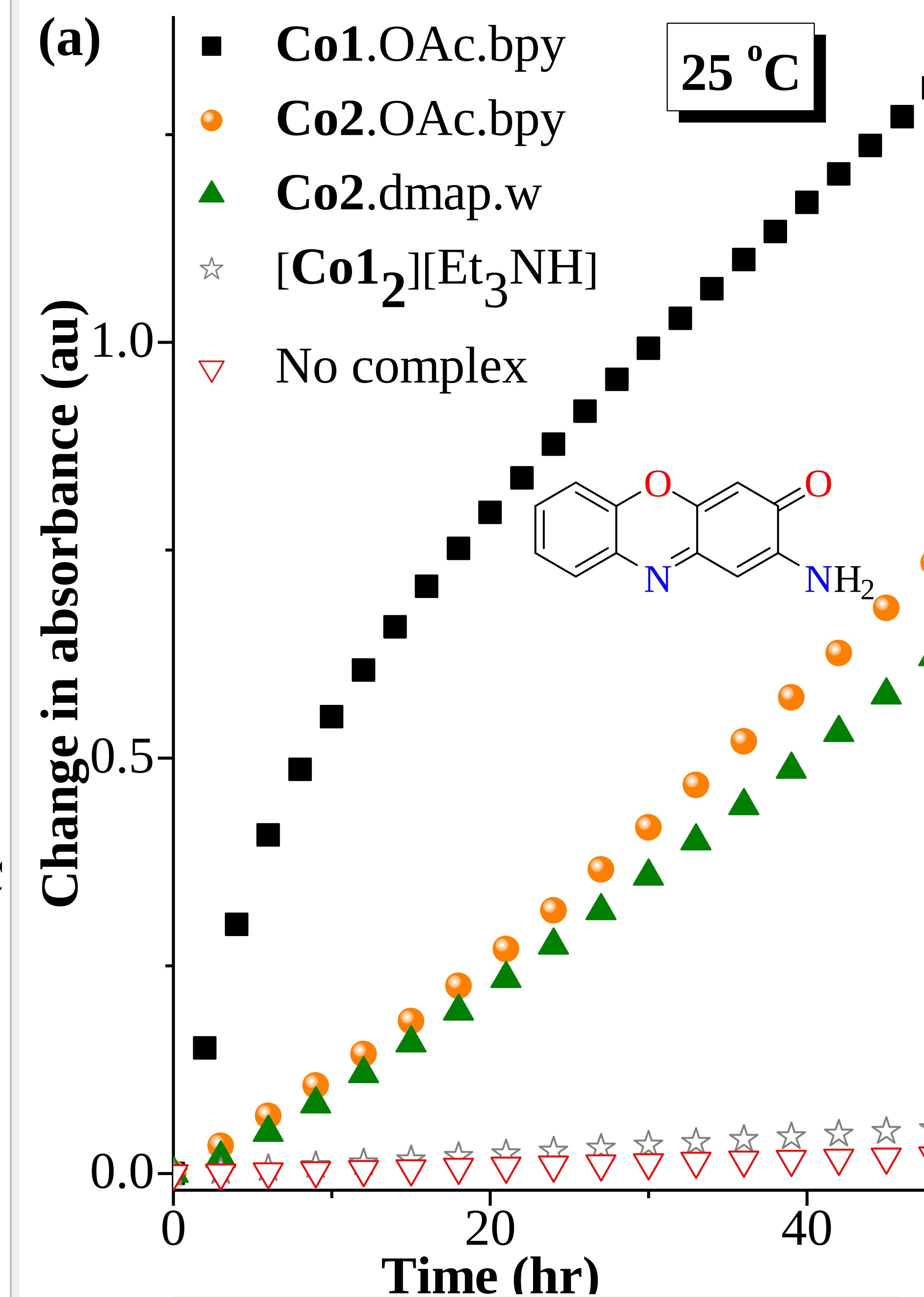


Table 1: Biomimetic behaviour of the complexes. Conditions: 1:100 catalyst to OAPH, 25 °C

Complex	V (h ⁻¹) × 10 ³
No complex	0.46
Co1.OAc.bpy	23.30
[Co1 ₂][Et ₃ NH]	1.15
Co2.OAc.bpy	15.48
Co2.dmap.w	13.30

Catalytic Result



Conclusion: The biomimetic behaviour of the complexes is dependent on their structural differences while thermal effect also play a significant role.