Anais da 48ª Reunião Anual da SBQ

48ª Reunião Anual da Sociedade Brasileira de Química

Campinas-SP
2025

Revisão textual e gramatical: Resposanbilidade dos respectivos autores.

Dados Internacionais de Catalogação na Publicação (CIP)
(Câmara Brasileira do Livro, SP, Brasil)

Reunião Anual da SBQ (48. : 2025 : Campinas, SP)
Anais da 48ª Reunião Anual da SBQ [livro eletrônico] / Sociedade Brasileira de Química. -- 1. ed. -- Campinas, SP : Aptor Software, 2025.
PDF

Vários autores.
Vários colaboradores.
Bibliografia.
ISBN 978-85-63273-70-3

1. Química I. Sociedade Brasileira de Química. II. Título.

25-282696 CDD-540

Índices para catálogo sistemático:

1. Química 540

Eliete Marques da Silva - Bibliotecária - CRB-8/9380

Área: INO

Ruthenium-quinoline based complexes: synthesis, characterization and cytotoxic activity

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Keywords: *Biological inorganic chemistry, Ruthenium complexes, 8-Hydroxyquinoline, Cancer.*

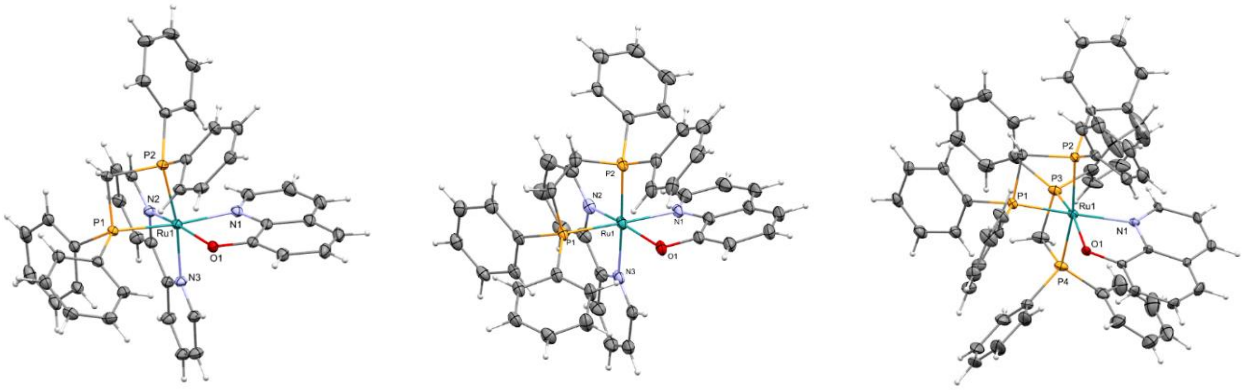
Highlights

Four ruthenium-quinoline complexes were synthesized and characterized

Resumo/Abstract

Recent advances in anticancer drug research have identified ruthenium as a promising metal center for novel therapies.[1] In this work four complexes, bearing 8-Hydroxyquinoline (8hq) as ligand, were synthesized and characterized: (**1**) [Ru(8hq)(dppm)(bipy)]PF_6, (**2**) [Ru(8hq)(dppen)(bipy)]PF_6, (**3**) [Ru(8hq)$(dppm)_2$]PF_6 and (**4**) [Ru(8hq)$(bipy)_2$]PF_6, where dppm = bis(diphenylphosphino)methane, dppen = cis-1,2-Bis(diphenylphosphino)ethylene and bipy = 2,2′-bipiridine. The molar conductivity in dimethyl sulfoxide (DMSO) revealed the electrolytic nature (1:1) of the complexes, supported by the signal at -144 ppm in the $^{31}P\{^1H\}$ NMR spectra (referring to the PF_6^- counter-ion). Single crystals of complexes (**1**), (**2**) and (**3**) were obtained from slow evaporation of a dichloromethane/methanol solvent mixture and the structures were determined by X-ray diffraction (**Fig. 1**). The $^{31}P\{^1H\}$ NMR spectra of the complexes indicated magnetic non-equivalence of the phosphorus atoms, displaying two sets of doublets, for (**1**) and (**2**), and a doublet of doublets of doublets pattern for (**3**). The stability of the complexes in solution was evaluated in DMSO and in a mixture of DMSO/DMEM (90:10) using $^{31}P\{^1H\}$ NMR for (**1**), (**2**) and (**3**) and ^1H NMR for (**4**). The complexes remained stable after 48 hours. Cytotoxic effects on cancerous and non-cancerous cells are being assessed through ongoing *in vitro* assays.

Fig.1. Crystal structure of (**1**), (**2**) and (**3**) showing the atom labels and ellipsoids with 30% of probability (the counterions were omitted).



[1]KARATI, Dipanjan et al. **Coordination Chemistry Reviews**, v. 519, p. 216118, 2024.

Agradecimentos/Acknowledgments

FAPESP (#2021/01787-0 and 2023/02475-8), CAPES, CNPq and PPGQ UFSCar. Roberto S. Silva thanks the NUPEM (UFRJ), Macaé, for the opportunity.