

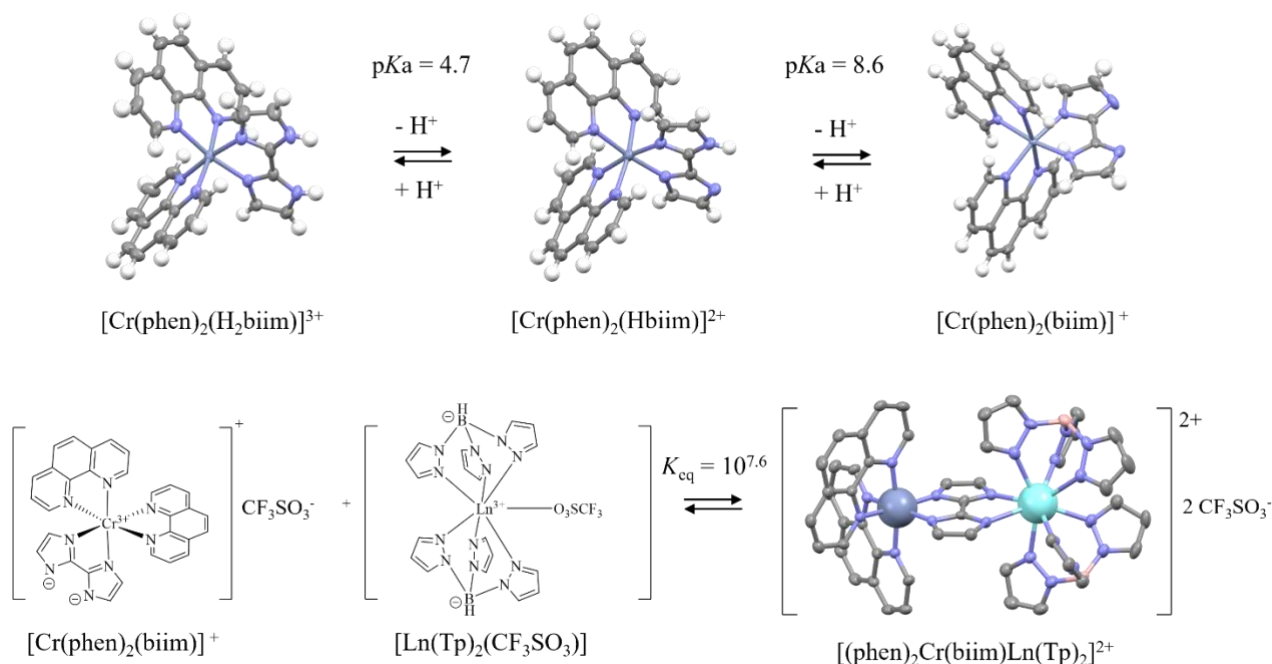
## Synthesis and characterization of Cr-Ln heterometallic complexes with a biimidazolate bridge

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The synthesis of discrete heteropolymetallic structures has long intrigued chemists due to their ability to bring close together different open-shell metals, thus opening vast possibilities for magnetic communications,<sup>1</sup> or energy transfers upon photoexcitation.<sup>2</sup> A prominent synthetic route is the complex-as-ligand strategy, wherein a metal complex bearing a bridging ligand is reacted with a secondary metal. Cr(III), which is well-known for its kinetic inertness toward ligand exchange, is particularly suited for preparing heteroleptic complexes amenable to this approach.

In this context, we synthesized the complex  $[\text{Cr}(\text{phen})_2(\text{H}_2\text{biim})]^{3+}$ , where  $\text{H}_2\text{biim}$  stands for 2,2'-biimidazole, a ligand easily deprotonable after complexation. Treatment of  $[\text{Cr}(\text{phen})_2(\text{H}_2\text{biim})]^{3+}$  with a base yielded  $[\text{Cr}(\text{phen})_2(\text{biim})]^+$  where  $\text{biim}^{2-}$  has two N atoms available for further coordination.  $[\text{Cr}(\text{phen})_2(\text{biim})]^+$  could then be reacted with  $[\text{Ln}(\text{Tp})_2\text{OTf}]$  lanthanide cargoes affording the dinuclear heterometallic assemblies  $[(\text{phen})_2\text{Cr}(\text{biim})\text{Ln}(\text{Tp})_2]^{2+}$  ( $\text{Ln} = \text{Y}, \text{Eu}, \text{Er}$ ). The photophysical properties of these Cr(III)-Ln(III) dyads were investigated via absorption and emission spectroscopy.



### References:

- [1] Shukla, P.; Das, S.; Bag, P.; Dey, A. *Inorg. Chem. Front.* **2023**, *10* (15), 4322–4357.
- [2] Chen, F.-F.; Chen, Z.-Q.; Bian, Z.-Q.; Huang, C.-H. *Coord. Chem. Rev.* **2010**, *254* (9), 991–1010.