

Switchable Pd^{II}/Pt^{II} Heterometallic Supramolecular Cages

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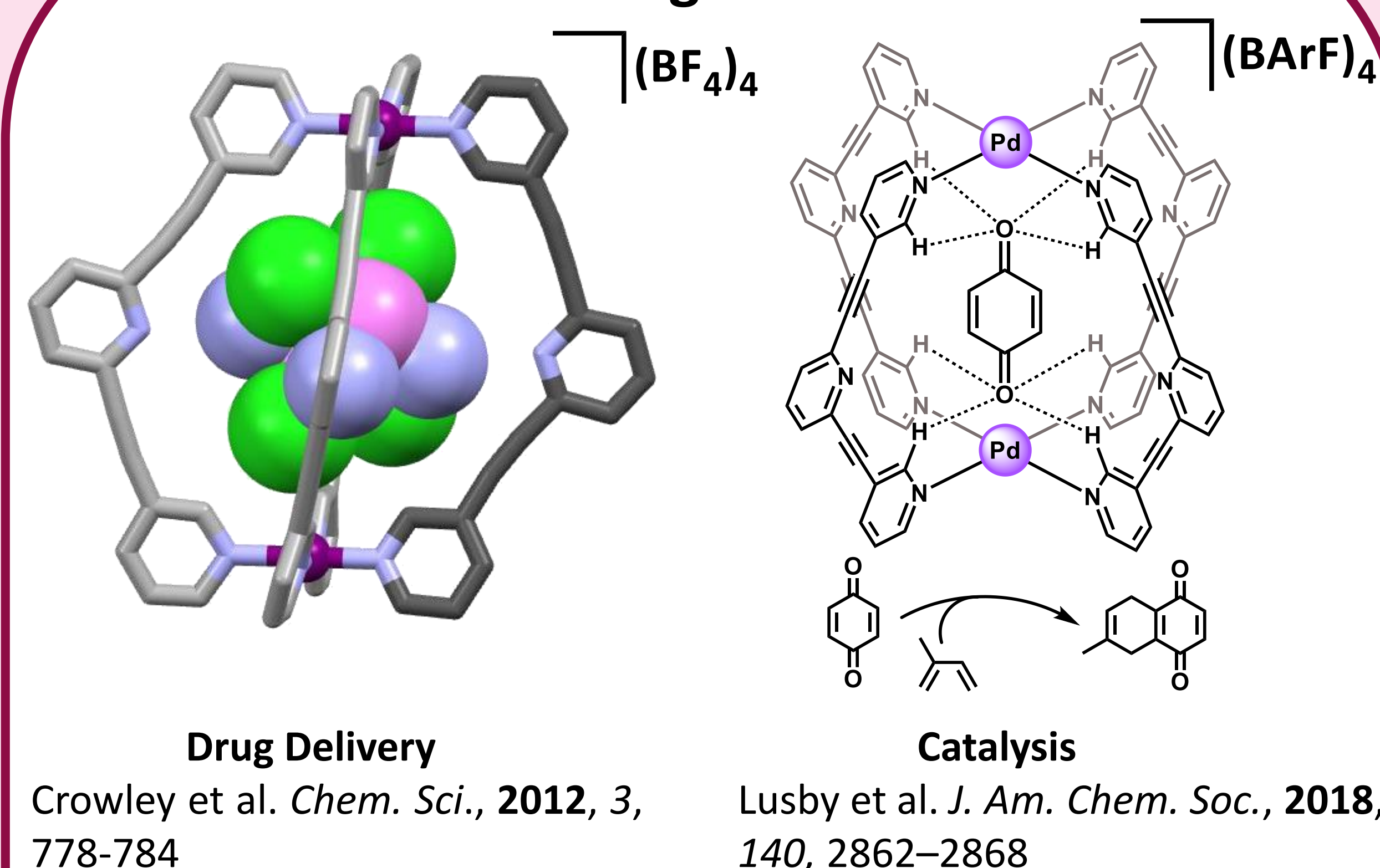
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Introduction

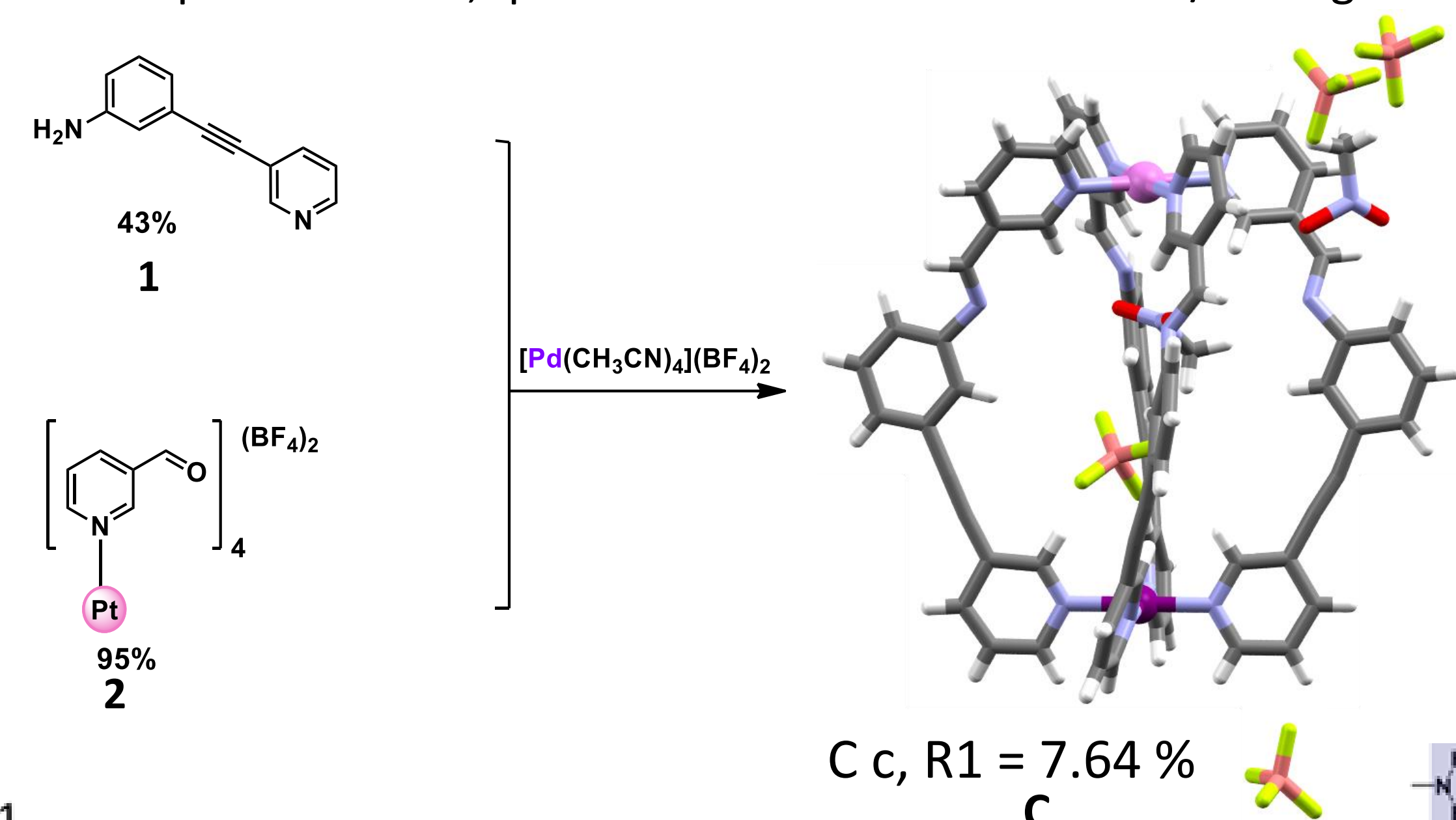
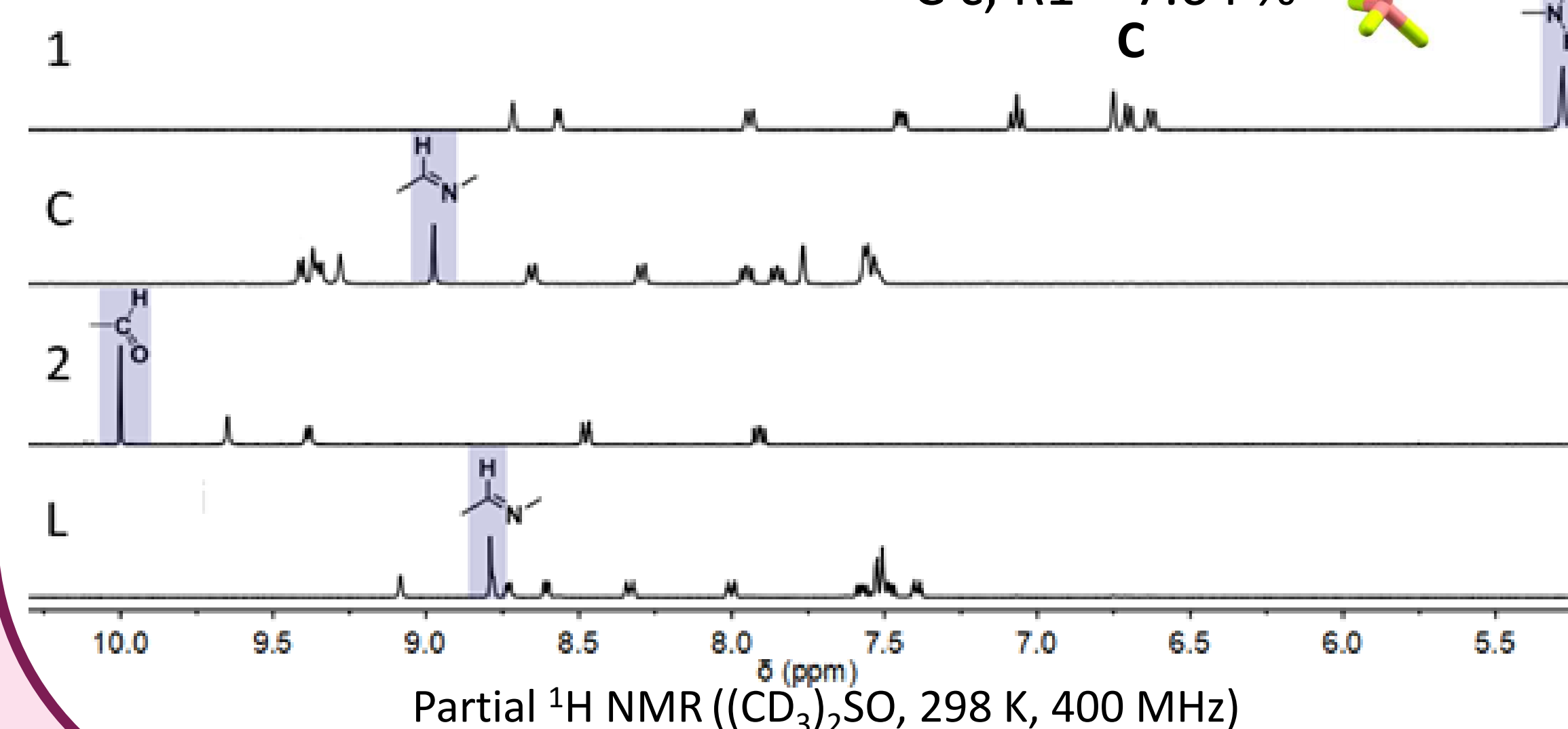
Metallosupramolecular cages are architectures with central cavities capable of guest binding.¹ Such cages have promising applications in drug delivery², catalysis³ and molecular encapsulation.⁴ However, they are limited by their inability to selectively release guest molecules without completely disassembling.⁵ Following from previous work by the Crowley group, we have synthesised a heterometallic cage that can partially disassemble and reassemble with the addition and elimination of the competitive ligand DMAP. In this manner, we have synthesised a switchable Pd^{II}/Pt^{II} cage that can encapsulate and release guest molecules without the need for complete disassembly and easily reform into its original structure post guest release.⁶ We have also synthesised Fe₂L₃ helicates and studied their cytotoxic properties against selected cancerous cell lines.⁷

Background

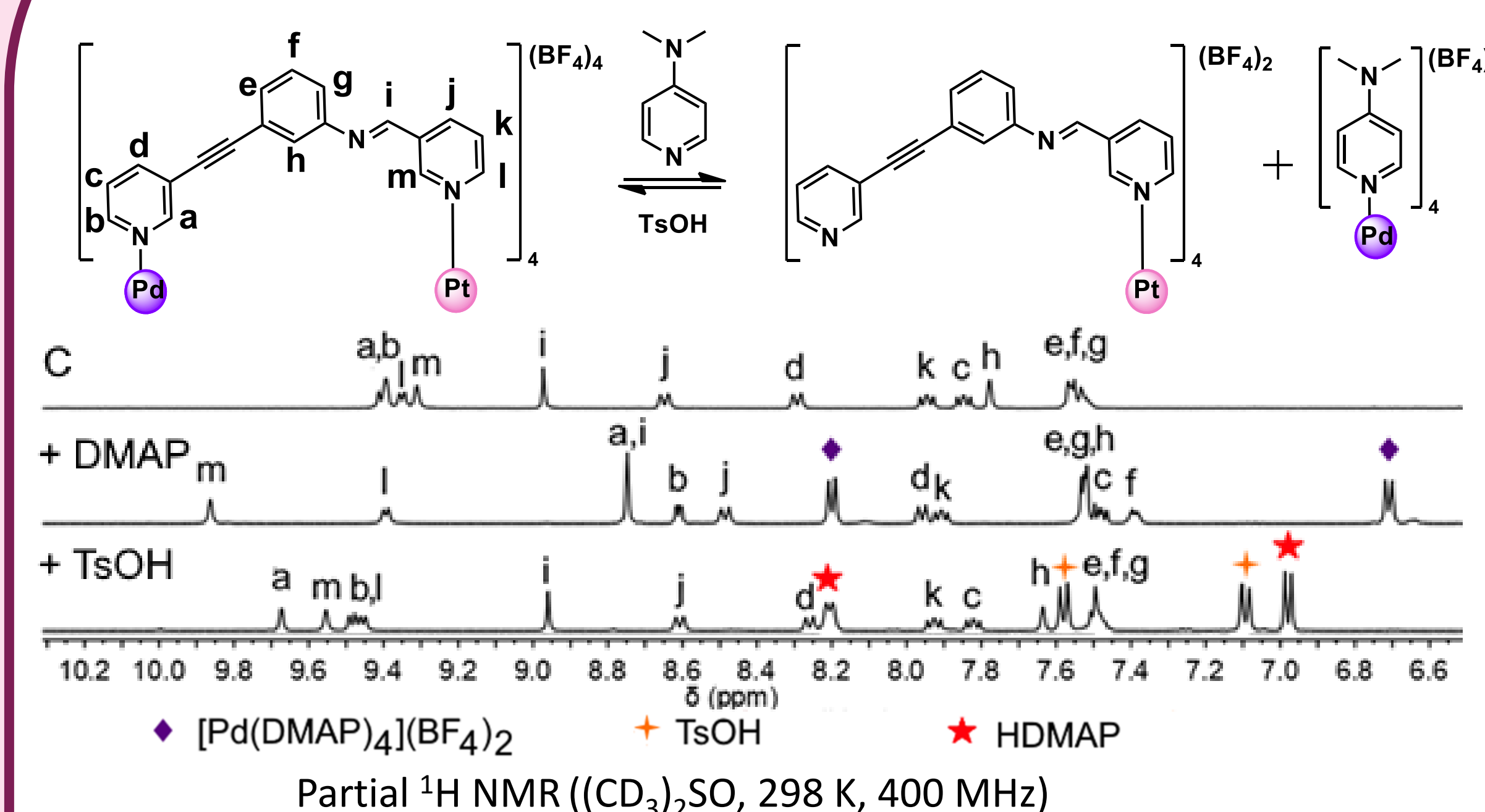


Pd^{II}/Pt^{II} Heterometallic Cage Synthesis

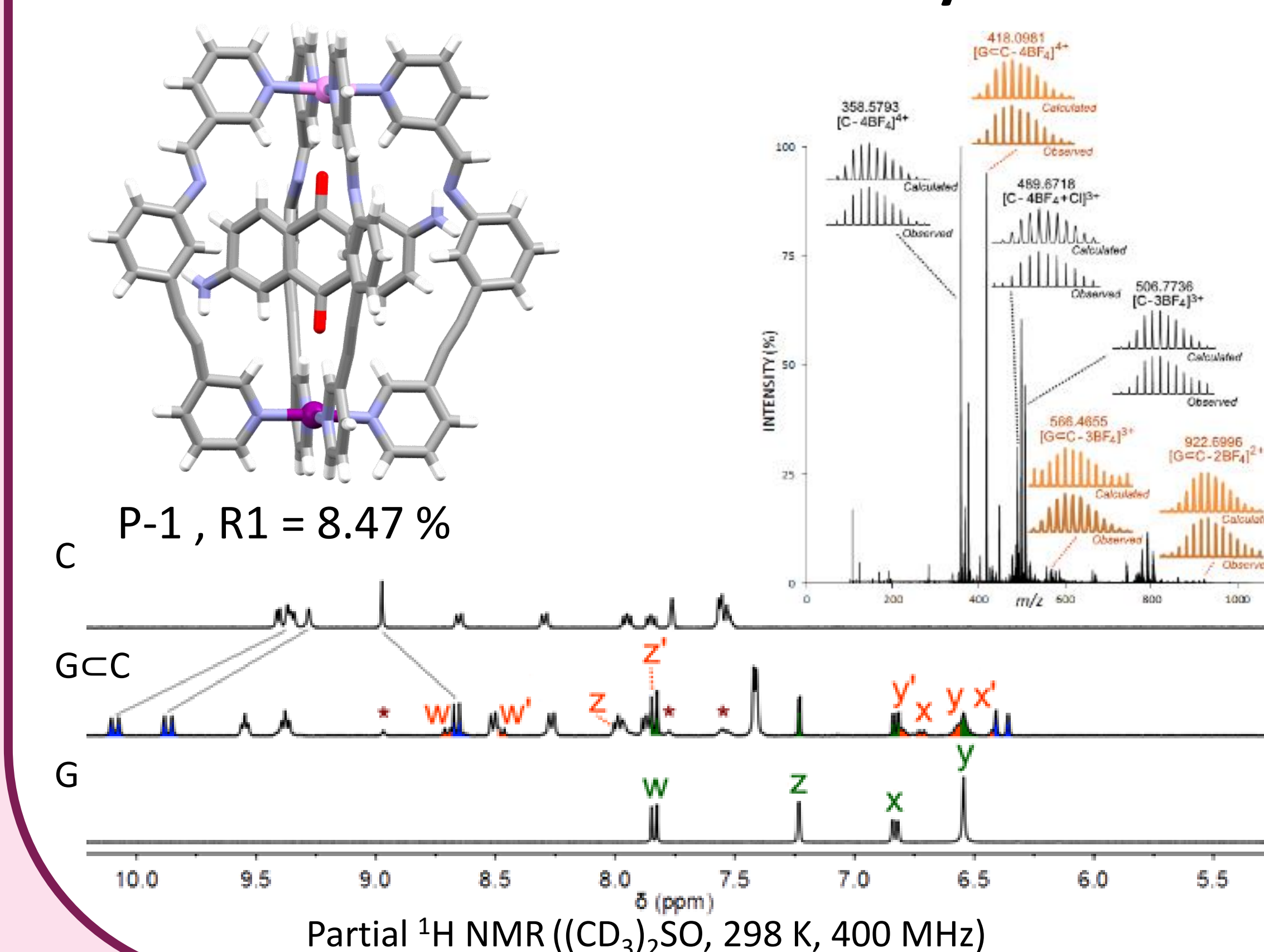
We have previously attempted to synthesise heterometallic cages using a variety of approaches with no success. However, the method below provides clear, quantitative formation of the Pd^{II}/Pt^{II} cage.



Switchability



Host-Guest Chemistry



Fe₂L₃ Helicates

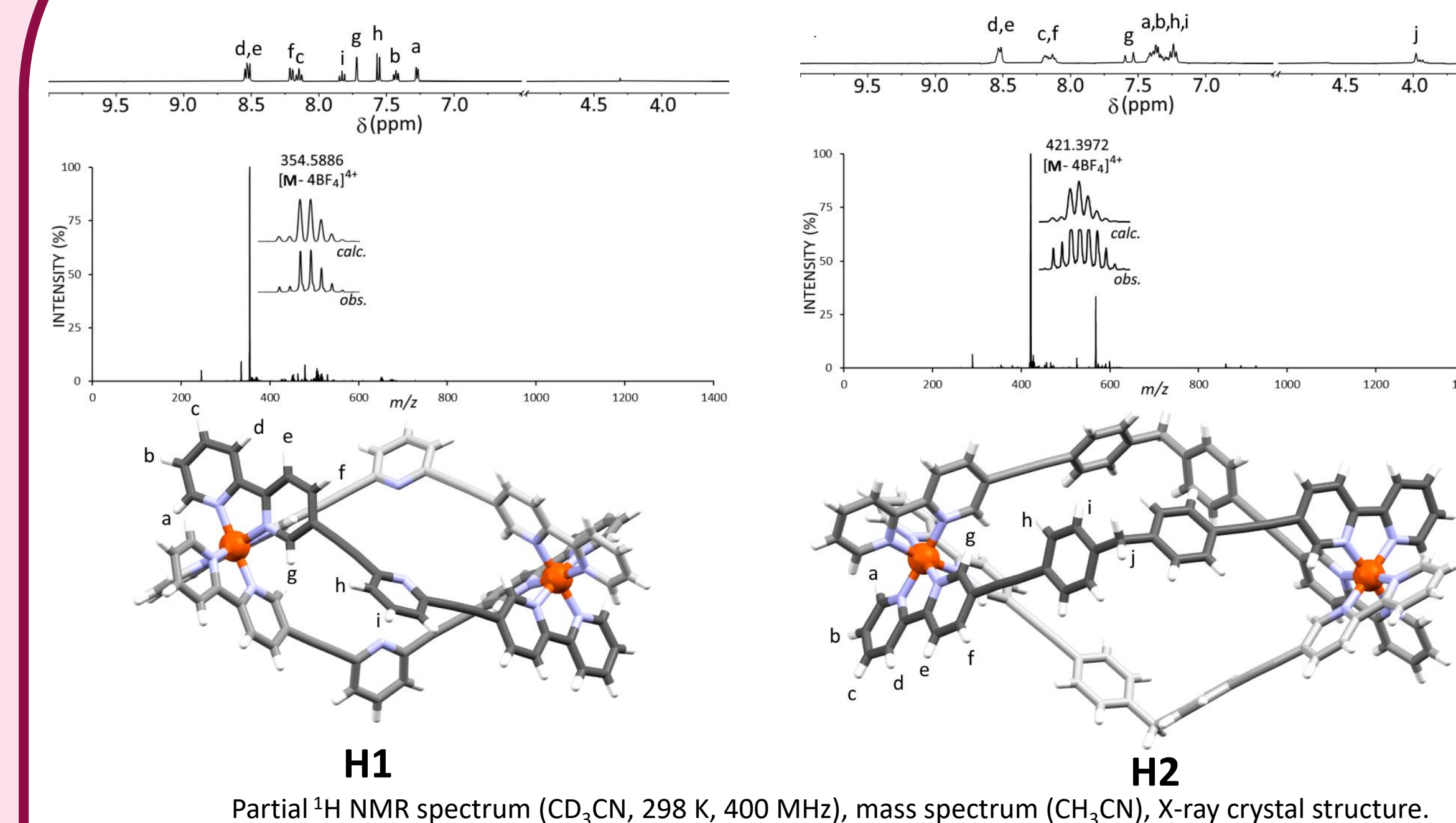


Table 1 IC₅₀ values (μM) of H1 and H2 against human colorectal carcinoma (HCT116), human non-small lung carcinoma (NCI-H460), human cervical carcinoma (SiHa), human colon adenocarcinoma (SW480) cancer cells after an incubation period of 72 hours.

Compound	HCT116	NCI-H460	SiHa	SW480
[Fe(H ₂ O) ₆](BF ₄) ₂	>200	184 ± 11	>500	>300
H1	7.1 ± 0.5	4.9 ± 0.4	39 ± 2	24 ± 4
[Fe ₂ (L10) ₃](BF ₄) ₄	19 ± 1	46 ± 15	55 ± 15	13 ± 4
H2	2.5 ± 0.3	0.80 ± 0.03	3.0 ± 0.6	8.1 ± 2.9

References

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