

PERTECHNETATE TALES: SUPERACIDS, NEW PERTECHNETATE FAMILY MEMBERS, AND THE COLOUR OF PERTECHNETIC ACID

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The talk will cover our recent results on preparative technetium chemistry. Two main topics will be presented: First, the interaction of pertechnetates with mixtures of triflic acid and triflic anhydride. New triflate compounds were prepared and characterised using S-XRD, HR-XANES, EPR, UV-vis and computational methods. The results confirm the formation mechanism of a recently discovered polyoxometallate and the auto-reduction of pertechnetate in highly acidic media to oxidotechnetate(V) species. Secondly, we describe the preparation of novel pertechnetate salts from main group, transition and f-elements, by using freshly generated pertechnetetic acid. So far, single crystals of more than 20 pertechnetates have been obtained by our technetium undergraduate research group (TURG) and have been structurally characterised for the first time. These compounds provide valuable new starting materials for the study of technetium complexes in nuclear waste streams and the results enable a systematic discussion of bond parameters, hydration and coordination effects and optical properties in the solid state, both along groups and periods of the periodic table.