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Reaction of Rhenium(V) with a mixed donor, phosphine thioether
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Radiopharmaceuticals are drugs labeled with a radioisotope. The radiopharmaceuticals are used in the diagnosis of cancer while functioning like materials in the body without any pharmacological significance. The bifunctional chelate approach for radiopharmaceuticals involves a biomarker that targets the tumor linked to a chelate that holds the radioisotope. This type of research is possible because tumors have a higher density of surface receptors for specific peptides than normal cells. Utilizing the bifunctional chelate approach, a radiopharmaceutical can be localized at tumor sites. Chelation is the binding of a ligand to a metal ion. The ligands bind to the metal atom to produce a heterocyclic ring. The chelate is a mixed donor, phosphine thioether. Rhenium is an important radiopharmaceutical component because it offers a non-radioactive model for Technetium. $^{186}$Re and $^{188}$Re are therapeutically usefully based on their half-lives and beta energies emitted. Re(V), in the form of ReOCl$_3$(PPh$_3$)$_2$, was reacted with a phosphine-thioether ligand. The product has a dioxo core and was fully characterized.