Crystallographic analysis of hydrazine coordination modes with dichlorotris(triphenylphosphine)ruthenium(II)

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Hydrazine and its derivatives are important chemicals in the aerospace industry due to their application in rocket propulsion. The unique chemical properties of hydrazine, such as hypergolicity and its ability to rapidly decompose while passing over a catalytic surface (i.e. a transition metal), make it a versatile choice for many propulsion applications. Although the decomposition mechanisms of propellants have been a topic of interest since the field's inception, little work has focused on examining hydrazine interactions with catalytic surfaces in the monopropellant regime. Serving as a model substrate, the prominent catalyst, RuCl2(PPh3)3, was explored with various hydrazines. The products were subsequently studied using single crystal X-ray diffraction in order to gain insight into the coordination behavior and reactivity. This poster illustrates the bonding modes and complex chemistry of the materials from this investigation.