The rich complexation chemistry of phosphaalkynes, especially that of 2,2-dimethylpropylidynephosphane, supported by numerous reactions, has served a novel reaction type. Reaction of tetrakis(dicarbonylmanganese) with 2,2,8,8-tetramethyl-S-oxa-4,6-diphospha-3,6-nonadiene surprisingly results in formation of a presumably very reactive complex with the formation of a ligand can be formally valid for all manganese atoms in 3, this finding prompted us to carry out magnetic measurements. They revealed a field-dependent paramagnetism for 3 between 50 K and room temperature. The magnetic moment increases monotonically between 77.6 K and room temperature, the susceptibility obeys the Curie-Weiss law ($\theta = -53.5$ K). Since the 18-electron rule is formally valid for all manganese atoms in 3, this finding is particularly surprising. Tetragonally or trigonally distorted coordinated Mn$^4$ (d$^8$) provides a possible explanation, especially since the Mn-Mn distances (Mn1-Mn2 = 243.8(3), Mn2-Mn3 = 215.6(10), Mn3-Mn4 = 164.3(7)) are coordinated. The formation of this ligand can be formally understood as the addition of one molecule of H$_2$O to two molecules of 1. Since the reaction was carried out in dried solvents under inert gas, the source of the water is not yet known. The reaction might involve the initial formation of a presumably very reactive complex with the solvent tetrahydrofuran (THF). In view of the diverse reactions of phosphaalkyne complexes, such secondary reactions are certainly conceivable. Unfortunately, the introduction of D$_2$O into the reaction mixture did not lead to unequivocal results.

The molecular ion is readily apparent in the EI and the FD mass spectra; in addition, 3 was characterized by its elemental analysis and the usual spectroscopic data, as well as by X-ray structure analysis. As revealed in Figure 1, the bis(phosphavinyl) ether ligand functions as an eight

$$4 \left[ \eta^5-(\text{C}_8\text{H}_{14}\text{CH}_3)\text{CO}_2\text{Mn(THF)} \right] + P = C-C-(\text{C}_8\text{H}_{14}\text{CH}_3) \overset{\text{4 THF} + \text{H}_2\text{O}}{\longrightarrow}$$

(3)

This compound contains the first bis(phosphavinyl) ether ligand, to which four $(\text{C}_8\text{H}_{14}\text{CH}_3)\text{Mn(CO)}_2$ fragments are coordinated. The formation of this ligand can be formally understood as the addition of one molecule of H$_2$O to two molecules of 1. Since the reaction was carried out in dried solvents under inert gas, the source of the water is not yet known. The reaction might involve the initial formation of a presumably very reactive complex with the solvent tetrahydrofuran (THF). In view of the diverse reactions of phosphaalkyne complexes, such secondary reactions are certainly conceivable. Unfortunately, the introduction of D$_2$O into the reaction mixture did not lead to unequivocal results.

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CAS Registry numbers:
1. 78129-68-7; 2. 51922-84-0; 3. 109907-06-4; [(η^1-C_9H_23CH_3)Mn(CO)_2]_3

   δ = 5.31 (s, C-H, (8 H)), 4.80 (s, C-H, (8 H)), 4.26 (s, CH (2H)), 2.11 (s, CH, (6 H)), 1.96 (s, CH_3 (6 H)), 1.36 (t, C(CH_3) (18 H)), 31P-NMR (90 MHz, H_2PO_4 ext., 25°C): δ = +414.89 (s); IR (ν_CO [cm^-1], KBr): 1964 vs, 1935 vs, 1929 vs, 1903 s, 1866 vs; FD-MS (160°C, toluene, ether): m/z 978 (M^+).