Synthesis and Crystal Structure of the Novel Three-dimensional Vanadium Coordination Compound Potassium Oxo-bis(hydroxylamido)malonatovanadate(V)

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In the crystal structure of the title complex, $K_2[(VO)_2(NH_2O)_4(C_3H_2O_4)_2] \cdot 3H_2O$, the V(V) centre is bound to a chelating malonate ligand, two bidentate hydroxylamido ligands and one oxo ligand, defining a pentagonal bipyramidal coordination (VO_5N_2). The potassium cations are found to adopt two types of coordination geometry with the malonate ligand, the bidentate hydroxylamido ligand and water molecules: the first one is hepta-coordinate in an irregular $K(1)O_7$ polyhedron, and the second one is octa-coordinate in an irregular $K(2)O_8$ polyhedron. The $K(1)O_7/K(2)O_8$ and VO_5N_2 polyhedra are closely linked by sharing faces to form K-V dinuclear units KVO_9N_2 and $KVO_{10}N_2$, respectively. The two close-packed units, KVO_9N_2 and $KVO_{10}N_2$, are connected by sharing edges to generate a tetrameric unit $K_2V_2O_{17}N_4$. Each of these units is joined to four neighbouring units by sharing corners, providing further propagation into a two-dimensional layer. Adjacent layers are connected *via* the carboxylic oxygen atoms of the malonate units to give a three-dimensional framework in the crystals.

Key words: Vanadium Compounds, Hydroxylamine, Insulin Mimics, Malonic Acid