The title compounds were synthesized from potassium rich mixtures of Fe₂O₃, elemental potassium and the hyperoxide KO₂ by applying short reaction times, a maximum temperature of 875 K and subsequent quenching of the samples. The structures of the two new oxoferrates(III) have been determined by single crystal X-ray diffraction. The orthoferrate(III) K₅[FeO₄] (Na₅[GaO₄] structure type, space group *Pbca*, *a*=1124.0(2), *b*=667.95(9), *c*=2034.8(3) pm, *Z*=4, *R*₁=0.0585) exhibits isolated ortho-anions [FeO₄]⁻⁵⁻ with nearly ideal tetrahedral geometry and Fe-O distance in the narrow range of 189 to 192 pm. The pentaferrate K₁₇[Fe₅O₁₆] (space group *Cm*, *a*=671.71(5), *b*=3560.8(3), *c*=670.81(5) pm, *β*=119.687(5)°, *Z*=2, *R*₁=0.0291) crystallizes with a new structure type. Its building units are isolated novel penta-nuclear anions composed of five corner sharing [FeO₄] tetrahedra. These linear chain pieces [Fe₅O₁₆] are arranged in a hexagonal rod packing, with a stacking sequence according to |:AB:| along the large monoclinic *b* axis. The structure is thus related to that of the tetra-ferrate K₁₄[Fe₄O₁₃] with a comparable packing of tetra-nuclear ferrate(III) anions.

**Key words:** Ferrates, Oxoferrates, Potassium