1. Introduction

The chemical properties of metalloporphyrins and their use as catalysts in oxidations chemistry have received considerable attention in recent years [1,2]. These compounds are interesting because of the similarity to the oxidation enzymes [1,2]. In order to learn more about the structure and catalytic properties of these systems in nature, metalloporphyrins have served as model substrates [1,2]. Another aspect of the chemistry of metalloporphyrins is their applications in modern organic synthesis as catalyst for various selective reactions [2]. The catalytic properties of metalloporphyrins is related to the formation of a high-valent oxotransition-metal porphyrin intermediate, 1, by reaction of a transition-metal porphyrin with a terminal oxidant, XO, (Scheme 1). The formed high-valent oxotransition-metal porphyrin intermediate, 1, is thus capable of transferring the oxygen atom to various organic substrates, SO (Scheme 1). It can also catalyze the oxidation of organic substrates by electron-transfer reactions [1-3].
A variety of organic substrates has been catalytically oxidized by metalloporphyrins, as e.g. unactivated C-H bonds to the corresponding alcohols. Other oxidations include alcohols to carbonyls, alkenes to epoxides, sulfides to sulfoxides and sulfones, primary amines to nitro compounds, secondary amines to imines, deamination of tertiary amines to the corresponding secondary amine and nitroso to nitro compounds [1-4].

The mechanism of these metalloporphyrin catalyzed reactions all involve formation of the high-valent oxometal porphyrin species, O=M [5]. Many stable oxotransition-metal complexes are known and have been characterised, but several of these complexes are unreactive as oxygen-transfer reagents. Different metalloporphyrin systems, containing different transition metals, porphyrins and axial ligands have been studied. Depending on the transition metal, the stability of the high-valent oxotransition-metal porphyrin intermediate, 1 varies, as oxotransition metal porphyrin complexes containing early transition metals have been characterised by X-ray spectroscopy, whereas oxotransition-metal porphyrin complexes with transition metals from manganese to the late transition metals have not yet been fully characterised. The oxometalloporphyrins containing transition metals as titanium and vanadium are stable at room temperature, but no oxygen-transfer reactions are observed [2]. Oxochromium