
Abstract
The potential role of vanadium in human health is described as a building material of bones and teeth. However, another very interesting and promising application for vanadium in human health emerges from recent studies that evaluated the role of vanadium in the management of diabetes. Vanadium is present in a variety of foods that we commonly eat. Skim milk, lobster, vegetable oils, many vegetables, grains and cereals are rich source of vanadium (>1 ppm). Fruits, meats, fish, butter, cheese, and beverages are relatively poor sources of vanadium. The daily dietary intake in humans has been estimated to vary from 10 microg to 2 mg of elemental vanadium, depending on the environmental sources of this mineral in the air, water, and food of the particular region tested. In animals, vanadium has been shown essential (1-10 microg vanadium per gram of diet). There is only circumstantial evidence that vanadium is essential for humans. However, in doses ranging from 0.083 mmol/d to 0.42 mmol/d, vanadium has shown therapeutic potential in clinical studies with patients of both insulin-dependent diabetes mellitus (IDDM) and noninsulin-dependent diabetes mellitus (NIDDM) type. Although vanadium has a significant biological potential, it has a poor therapeutic index, and attempts have been made to reduce the dose of vanadium required for therapeutic effectiveness. Organic forms of vanadium, as opposed to the inorganic sulfate salt of vanadium, are recognized as safer, more absorbable, and able to deliver a therapeutic effect up to 50% greater than the inorganic forms. The goal is to provide vanadium with better gastrointestinal absorption, and in a form that is best able to produce the desired biological effects. As a result, numerous organic complexes of vanadium have been developed including bis(maltolato)oxovanadium (BMOV), bis(cysteinamide N-octyl)oxovanadium known as Naglivan, bis(pyrrolidine-N-carbodithioato)oxovanadium, vanadyl-cysteine methyl ester, and bis-glycinato oxovanadium (BGOV). The health benefits of vanadium and the safety and efficacy of the available vanadium supplements are discussed in this review.