

hypoalbuminemia which will affect protein binding (Bushinsky & Monk, 1998;Lobo, 2004; Moon *et al.*, 2011 and Wang *et al.*, 2013).

#### **1.1.4 Magnesium**

Magnesium is the second most abundant intracellular cation after potassium and it is the fourth most abundant cation in human body. Normal magnesium levels lie between 1.5 and 2.4 mg/dL , with no correlation with weight (Wester, 1987 ; Rude, 1998; Ford & Mokdad, 2003 and Jahnen-Dechent & Ketteler, 2012). Thirty percent of magnesium in serum is bound to protein while 70% exists in the free form and therefore, can be excreted by kidney (Ford & Mokdad, 2003; Jahnen-Dechent & Ketteler, 2012).

Having two major unique characteristics; the ability to form chelates with major intracellular anions including ATP and the ability to compete with calcium on its binding sites, magnesium plays a major role in many physiological reactions (Table1). (Wester, 1987; Swaminathan, 2003; Jahnen-Dechent & Ketteler, 2012).

Furthermore, magnesium plays an important role in nucleic acids and proteins synthesis, and as a facilitator of more than 300 enzymes functions (Pasternak *et al.*, 2010; Jahnen-Dechent & Ketteler, 2012).

Magnesium influences enzymes activity by Ligand binding , Cofactor for the active site if enzyme, Causing conformational change during catalytic processes.