Answer on Question #50275, Chemistry, Inorganic Chemistry

1.'Na' is a reductant,

$Na - Na^{+} + e^{-}$

but can it act as an oxidant to become Na-? Is it stable?

2. Na^{5+}, Na^{4+}, Na^{3+}, Na^{2+}, are all possible Oxidation number..... but do all exist in real? Does it happens in the case of Halogens?

Answer:

1. Table salt, or sodium chloride $Na^{+}Cl^{-}$, sodium positive charge is balanced by a negatively charged ion in the empirical formula for this ionic compound. The traditional explanation for this phenomenon is that the loss of one electron from elemental sodium to produce a cation with a single positive charge produces a stable closed-shell electron configuration. Sodium was thought to always form singly charged cations until the discovery of **alkalides** and the same arguments apply to the remainder of the alkali metals. A typical **alkalide** is the sodium natride salt $[Na(2,2,2\text{-crypt})]^{+}Na^{-}$. This salt contains both Na^{+} and Na^{-}. The cryptand isolates and stabilizes the Na^{+}, preventing its reduction by the Na^{-}. Dimers of cationic and anionic sodium have also been observed, as has an $H^{+}Na^{-}$ salt known as "*inverse sodium hydride*".

2. Na^{5+}, Na^{4+}, Na^{3+}, Na^{2+}, are all possible oxidation numbers but doesn't exist in real. In case of Halogens it happens with all except of Fluorine, and quite stable (chlorine as an example):
Cl^{+1}, Cl^{+3}, Cl^{+5}, Cl^{+7}.