Potassium tetraiodomercurate(II)

Potassium tetraiodomercurate(II) is an inorganic compound consisting of potassium cations and the tetraiodomercurate(II) anion. It is mainly used as **Nessler's reagent**, a 0.09 mol/L solution of potassium tetraiodomercurate(II) ($K_2[HgI_4]$) in 2.5 mol/L potassium hydroxide, used to detect ammonia.[2]

Contents

Preparation and structure

Crystallizing from a concentrated aqueous solution of mercuric iodide with potassium iodide is the monohydrate $KHgI_3 \cdot H_2O$, which is pale orange.[3] In aqueous solution this triodido complex adds iodide to give the tetrahedral tetraiodo dianion.[4]

Solutions of K_2HgI_4 react with Cu(I) salts to give Cu_2HgI_4.[5]

Nessler's reagent

Named after Julius Neßler (Nessler), an alkaline solution of K_2HgI_4 is called Nessler's reagent. This pale solution becomes deeper yellow in the presence of ammonia. At higher concentrations, a brown precipitate may form. The sensitivity as a spot test is about 0.3 μg NH_3 in 2 μL.[6]

$$NH_4^+ + 2\ [HgI_4]^{2-} + 4\ OH^- \rightarrow \overset{\text{(iodide of Millon's base)}}{HgO \cdot Hg(NH_2)I} \downarrow + 7\ I^- + 3\ H_2O$$

The formula for the brown precipitate, a derivative of Millon's base, is given as $3HgO \cdot Hg(NH_3)_2I_2$ and as $NH_2 \cdot Hg_2I_3$.[7]

References

1. Lide, David R., ed. (2009). *CRC Handbook of Chemistry and Physics* (90th ed.). Boca Raton, Florida: CRC Press. p. 4-82. ISBN 978-1-4200-9084-0.

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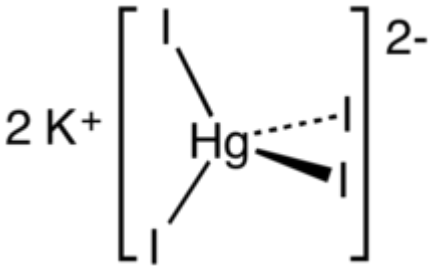

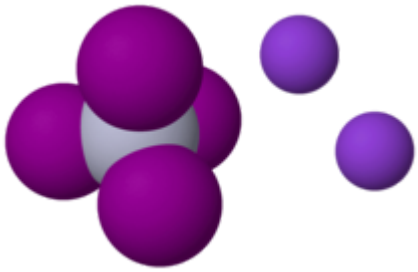

Names	
IUPAC name	potassium tetraiodidomercurate(II)
Other names	potassium mercuric iodide, Nessler's reagent (principal component)
Identifiers	
CAS Number	7783-33-7 ✓
3D model (JSmol)	Interactive image (https://chemapps.stolaf.edu/jmol/jmol.php?model=%5BK%2B%5D.%5BK%2B%5D.I%5BHg-2%5D%28I%29%28I%29I)
ChEBI	CHEBI:51568 (https://www.ebi.ac.uk/chebi/searchId.do?chebiId=51568) ✗
ChemSpider	22948 (http://www.ch