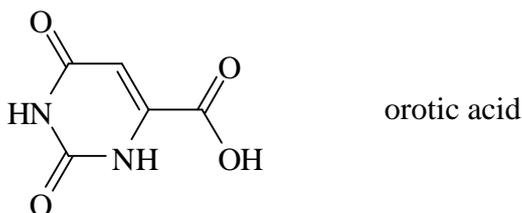


- Lithium salts, especially lithium carbonate, are commonly used in the treatment of bipolar disorder. Write the net ionic equation for the reaction which occurs between lithium carbonate and hydrochloric acid in the stomach.

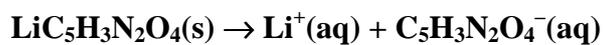


Lithium orotate (as a monohydrate salt, $\text{LiC}_5\text{H}_3\text{N}_2\text{O}_4 \cdot \text{H}_2\text{O}$) is a controversial alternative formulation sold in some health food stores. The orotate ion is the conjugate base of orotic acid, whose structure is shown below.



Like the carbonate, lithium orotate is taken orally. Using an equation, comment on any differences between the form in which lithium is bioavailable from these two lithium salts.

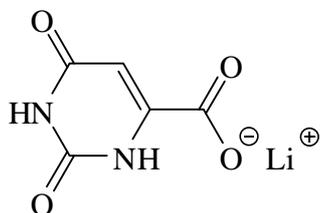
When lithium orotate, $\text{LiC}_5\text{H}_3\text{N}_2\text{O}_4$, dissolves in water, it forms $\text{Li}^+(\text{aq})$ ions and orotate ions:



Both lithium carbonate and lithium orotate thus give rise to the same form of lithium, $\text{Li}^+(\text{aq})$, when taken orally.

Like three of the bases found in DNA and RNA, orotic acid is a derivative of pyrimidine. Also like those bases, orotic acid and its salts have tautomers. Draw the structural formula of a tautomer of lithium orotate.

lithium orotate



tautomer of lithium orotate

