



Sulfite Test Strips

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Theory of the analysis

The reactive pad of the sulfite test strip contains sodium nitroprusside, potassium hexacyanoferrate and a zinc salt which turns a pink –red color depending on the sulfite ion concentration. The chemistry of this reaction is not fully understood.

Sulfites and free sulfurous acid give only a pale red color when reacted with sodium nitroprusside $\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}] \cdot 2\text{H}_2\text{O}$. The color is deepened by the addition of a saturated solution of zinc salt and a few drops of potassium ferrocyanide solution – which forms a red precipitate. The chemistry of this change has not been worked out but as with the test for sulfides using sodium nitroprusside a complex compound is formed.

Two pathways for the reaction procedure have been described:

- a) Saturated solution of zinc salt is precipitated with potassium ferrocyanide, then a solution of nitroprusside is added followed by a neutralized sample solution. In the presence of sulfites, a white precipitate turns red. The ferrocyanide also prevents the oxidation of sulfites during the reaction.
- b) A saturated zinc salt solution is precipitated with sodium nitroprusside causing a pink precipitate which in turn is decolorized by the ammonia vapours present during the reaction. In the presence of the sulfites the precipitate is then recolored red. The composition of red precipitate is suggested to be $\text{Zn}_2[\text{Fe}(\text{CN})_5(\text{NO})\text{SO}_3]$.

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