



Additional Information

Potassium nitrate is a white powder. While it looks very plain, it has many different uses. This white powder can be used in food preservatives, toothpaste for sensitive teeth, fertilizers, fireworks, treatment for heart pain and to cool water. It produces a lilac flame when subjected to a flame test.

How does one molecular compound do so much? Potassium nitrate has the chemical formula KNO_3 and is made up of a potassium ion and a nitrate ion. When potassium nitrate is mixed with other chemicals, the interaction of the potassium, the nitrogen and the oxygen with the other compounds creates vastly different effects. For certain uses, potassium nitrate dissociates and only some of the molecules of either the nitrate or the potassium are used. In food preservatives, potassium nitrate contributes nitrate (NO_3^-) to prevent bacterial infection. In toothpaste for sensitive teeth, the potassium ions act on the nerves in the teeth and inhibit them from firing the next time they are stimulated. This means that the pain is not transmitted to the brain and the teeth thus feel less sensitive. In fertilizers, the potassium and the nitrogen help plants grow. In treatment for angina, where not enough blood is delivered to the heart, the nitrate helps relax and widen blood vessels which allow more blood to flow to the heart. Potassium nitrate is also used in gunpowder, which acts as the thrust in fireworks. In order to act as gunpowder, KNO_3 must be combined with charcoal (carbon) and sulfur. KNO_3 does not burn on its own but helps to combust the carbon and sulfur.