NOVON ® : A NOVEL, THREE-COMPONENT ADDUCT OF HYDROGEN PEROXIDE.

Hydrogen Peroxide and Carbamide Peroxide.

Hydrogen peroxide (H_2O_2) is well known bleaching compound. The bleaching action of hydrogen peroxide is greatly enhanced in an alkaline environment.

Alkalinity, or acidity, is measured on the pH scale. On this scale a pH of 7.0 is neutral, a pH less than 7.0 is acidic and a pH greater than 7.0 is alkaline.

In an acidic environment hydrogen peroxide is relatively stable and remains ineffective as a bleaching agent. However, in an alkaline environment hydrogen peroxide breaks down as follows:

$$H_2O_2 \rightarrow H^+ + OOH^-$$

The OOH^-, also known as the perhydroxyl ion, is responsible for the bleaching action.

Current whitening products use hydrogen peroxide or carbamide peroxide (a mixture of urea and hydrogen peroxide) as their active bleaching ingredient. To ensure that these products are stable, and have a good shelf-life, they are manufactured at a pH value less than 7.0. However, in order for hydrogen peroxide to effectively bleach, it needs to be in an alkaline environment!

NOVON ®

NOVON ® is the name given by SMT Research to a newly developed hydrogen peroxide containing compound.

NOVON ® has a unique inherent feature in that, when it is manufactured, it has a pH value of 6.5 – acidic and stable. However, when it is diluted with water, the pH value rises to 8.5 – alkaline and unstable. Therefore, on dilution, **NOVON ®** finds itself in an alkaline environment which is ideal for the breakdown of hydrogen peroxide and release of perhydroxyl ions. The increased amount of available perhydroxyl ions results in a more effective bleaching action.

NOVON ® tooth bleaching gels are manufactured with a pH value of 6.5. During use the gel is diluted by saliva in the mouth which produces the previously described pH rise. This does not happen with “conventional” gels.

The pH rise and subsequent release of perhydroxyl ions in a **NOVON ®** gel provides an enhanced bleaching effect. This produces the same bleaching as a conventional gel using a shorter application time. Furthermore, within the same timeframe, a similar level of bleaching will be achieved with a lower **NOVON ®** inclusion level.

The latter effect has been reported in results of clinical trials at the Eastman Dental Institute, University College, London (*In preparation, McDonald et al., 2010*).