

Sterilization theory of chlorine dioxide (outline)

The active form of chlorine dioxide is an oxidization action which is performed with a molecular level and carries out an immediate reaction to various kinds of different microbe sources.

Since organic acid is used by many metabolic processes of a microbe and it becomes by-products as a matter of fact, the microhabitat (microenvironment) of many organic matters has very strong acidity.

Under such conditions, it is ideal for making an isolation chlorine dioxide (ClO₂) emit quickly simultaneously with contact.

Furthermore, a convenient thing has many acid things especially like muramic acid or teichoic acid in which each component part of a bacterial cell wall is.

Then, the protein portion of the bacterial cytoplasmic membrane can be eroded, namely, destruction of protoplasm is brought about under the influence of considerable internal pressure, and the isolation chlorine dioxide results to extinction of a cell.

It is mostly shown clearly by old research that destruction of main metabolic enzyme (metabolic enzymes) is the maximum factor of the bactericidal action of chlorine dioxide.

As mentioned above, a chlorine dioxide reacts with amino acid easily.

It is remarkable in the thing of an aromatic series (aromatic) like the tyrosine (tyrosine) which contains sulfur content especially.

Protein is made of amino acid combination, and the three-dimensional form (3 dimensionals) and function are a result of 2 sulfuration combination of sulfur content amino acid.

If this combination is broken and fragrance amino acid decomposes, a proteinic form will change, and a function original as that result will be lost.

If 2 sulfuration combination in the erosion and enzyme to fragrance amino acid is solved, protein composition, functional transportation (active transport), and essential functions like the most active metabolic process will stop.

Of course, even if either of these etc. stops, a cell becomes extinct, but the chlorine dioxide which has such a function tells the powerful bactericidal action to minute bacteria eloquently.