

## Determination of MIC and MCC of chemical preservatives

Chemical preservatives permitted in foods help to reduce/control spoilage organisms and thereby extend the shelflife of foods. The susceptibility of organisms to the preservative depends on the concentration used. The efficacy of the preservative is determined by estimating minimum concentration required to inhibit the growth (minimum inhibitory concentration-MIC) and concentration required to completely kill the mtest microorganism (minimum bactericidal concentration – MBC). For each preservative MIC and MBC is determined by inoculating test cultures to the series of broth in tubes containing varying levels of the preservative. The MIC is the minimum concentration of the preservative at which the growth of the microorganism is inhibited. The MBC is the minimum concentration at which the microorganism is completely killed. The cidal concentrations are always higher than MIC values.

### **Materials required:**

Nutrient broth

Preservative such as paraben

Nutrient agar

Test microorganism

### **Procedure:**

A series of tubes containing 10 ml nutrient broth labeled 1 to 10 are added each with varying volume of preservative to get a concentration from 10 ppm to 200 ppm in different tubes. A constant volume (100 microliter) of test microorganism grown in nutrient broth is inoculated to each tube and incubated overnight at ambient temperature.

For determining MIC, the tubes are observed for growth (turbidity) and the first tube that shows no growth is recorded and the concentration of preservative in that tube is taken as inhibitory concentration.

For determining MBC, from the tubes that are not showing any growth a loopful of culture is subcultured on to nutrient agar and incubated for 24 hours at ambient temperature for colonies to develop. The first tube which on subculture did not give rise to colonies is recorded and the preservative concentration of that tube is considered as MBC.

**Result and comment:**