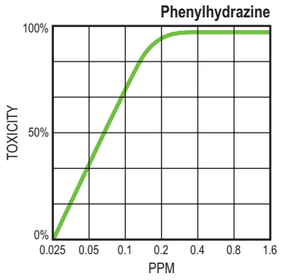
environmental bio detection products inc.
14 Abacus Road, Brampton, Ontario
Canada, L6T 5B7
Tel: (905) 794-2325
Fax: (905) 794-2338

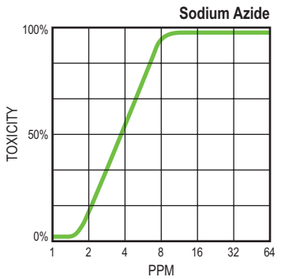
PLATE 1

Examples of toxicants tested by the Toxi-Chromotest

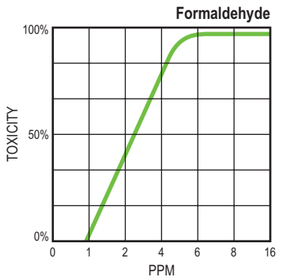
Toxic response of bacteria seen in the photograph is depicted in graphic form, relating percentage of toxicity to concentration of various substances, as follows:



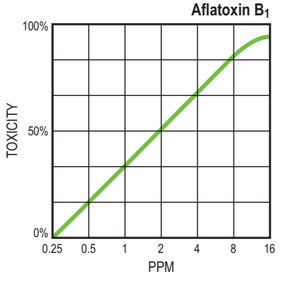
Columns 6 and 7 - Phenylhydrazine; blue chromogen substrate duplicated



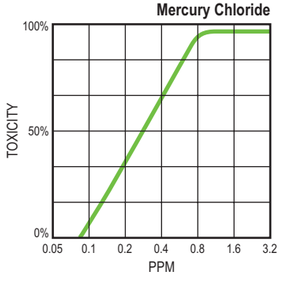
Columns 1, 2 and 3 - Sodium Azide; negative control, blue chromogen substrate duplicated



Columns 8 and 9 - Formaldehyde; blue chromogen substrate duplicated

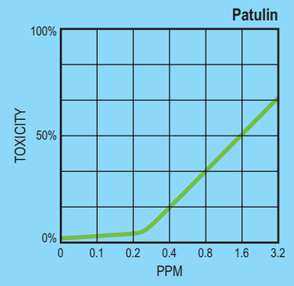


Columns 4 and 5 - Aflatoxin B_1; blue chromogen substrate duplicated

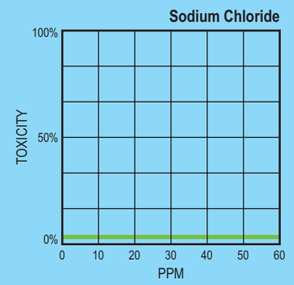


Columns 10 and 11 - Mercury Chloride; Chloride, blue chromogen substrate triplicated

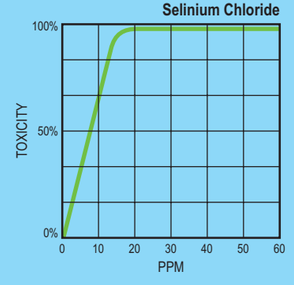
PLATE 2



Columns 1, 2, 3, 4, 5 and 6 - Patulin; blue chromogen substrate 5 replicants



Columns 7, 8, 9, 10, 11 and 12 - Sodium Chloride; blue chromogen substrate 5 replicants



Column N - Selinium Chloride; blue chromogen substrate 5 replicants

Some Toxicants Checked

Aflatoxin B1
Aldicarb
Azinphosmexthyl
Bendiocarb
Benzalkonium chloride
BHC-Gamma (Lindane)
Coumaphos
Cypermethyl
Deltametrin
Dieldrin
Diquat Dibromide
Endosulfan
Formaldehyde
Malathion
Methanearsonic acid (MSMA)
Patulin
Phenylhydrazine
Polyoxyethylene alcohols (Laneth)
Ronnel
Sodium arsenite
Sodium azide
Triphenyltin Hydroxide (Fentin hydroxide)
Triton X-100

Sensitivity:
from PPB to PPM

The Toxi-Chromotest
180 testpoints in one kit!
Fast, easy to perform, colorimetric field-oriented detection of toxicity.

THE TOXI-CHROMOTEST

Fast and Easy to Perform Colorimetric Detection of Toxicity

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Why do we need tests for toxicity?
With the increased industrialization of the civilized world, numerous chemicals are being introduced and used, and many of them pose problems with their release into the environment, affecting public health. For this reason many assays, chemical and biological, have been developed to meet the demand of screening for toxic substances. The biological assays detect active toxins and do not, usually, require a lengthy process of sample preparation. These assays may employ either multicellular eukaryotic organisms or microbes.

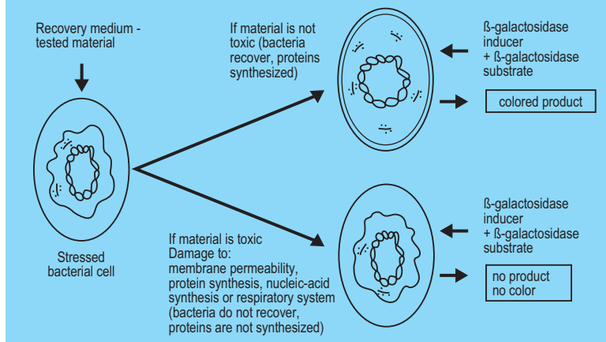
The advantages of bacterial tests
Incomparison with higher organisms, bacteria have the same biopathways, possess similar semipermeable membranes, and are therefore vulnerable to toxic substances which affect the membrane or biosynthetic pathways. In addition, bacteria have the advantage of rapid growth and enable the use of very large numbers in an analysis averaging out individual effects. Their cultivation is economical and one can use very small sample volumes in tests. Moreover, they allow for easy standardization of the technique.

The Principles of EBPI's Toxi-Chromotest
The TOXI-CHROMOTEST is a bacterial assay for the detection of toxicity. It is based on the ability of toxic materials and antibiotics to inhibit de novo synthesis of the inducible enzyme ß-galactosidase in a special bacterial strain of E.coli, which is highly sensitive to a wide spectrum of toxic substances such as pesticides, mycotoxins and heavy metals.

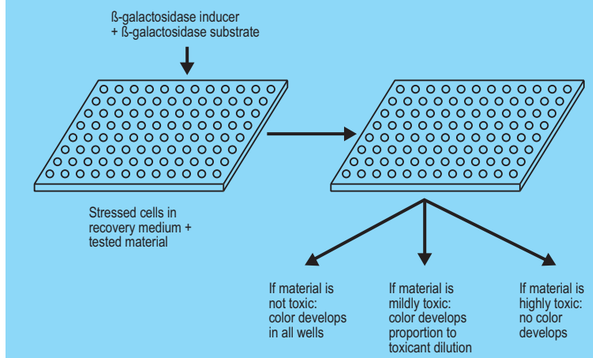
The sensitivty of the TOXI-CHROMOTEST is enhanced by exposing the bacteria to stressing conditions. The stressed bacteria are mixed with a cocktail containing essential factors required for the recovery of the bacteria from the stress conditions and a specific inducer for the enzyme ß-galactosidase. The ability of the cells to synthesize the enzyme depends on their ability to recover from the stress. The activity of the enzyme is detected by reacting it with a chromogenic substrate, resulting in clear, easily detectable color formation, which may be measured either visually or with a spectrophotometer at between 605 and 620nm. Toxic materials interfere with the recovery of most metabolic functions and thus with the synthesis of the enzyme, resulting in a decreased color formation.

The assay is:
- easy to perform
- rapid (2 hours)
- suitable for performance under field conditions
- sensitive to low concentrations of toxic materials.

The scientific principle of the Toxi-Chromotest



The Test



Each TOXI-CHROMOTEST kit contains 2 plates, each with 96 testpoints, and all the materials necessary to perform the assay.

Uses
The TOXI-CHROMOTEST kit can be used to detect toxicity in water, chemicals, pharmaceuticals, food, body fluids, etc. A variation of the test produced by EBPI - the toxi-chromopad test can be used on solid substrates such as soils, or sediments. EBPI offers complete technical and scientific support and will help select the appropriate sample preparation procedure for particular needs through its dedicated R&D department. When necessary, a collaborative study will be initiated for quick development of a specialized procedure.