

GT – Pesticide Residual Test Kit

Introduction Pesticides are poisonous agents limited for the agricultural use only. Remaining toxic substances must not exceed the amount specified in the Ministry of Public Health's Act No. 163 (1995 : B.E.2538) / Codex Maximum Residue Limits. In the fact those residues at the excess standard is still detected in many kinds of food. Now a day the several methods for the pesticide residues analysis are available, but the invested cost is very high. They need a long analysis time with the complicated instruments, such as GC, HPLC and GC-MS. Therefore the simple kit for screening the pesticides (organophosphates and / or carbamates) and or the other toxic cholinesterase inhibitors (neurotoxicants : which can not be detected by the standard method) with the fast reliable result has developed. In addition, in the case of the organic vegetables using no any pesticide, but may be used the extracts from the natural product spraying in the field for the purpose of killing insects, those extracts may be toxic from their matrix or from no limitation of spraying, the toxic residues in this case can not be detected by GC and HPLC methods, but this GT-KIT can be detected if the toxic is act like the cholinesterase inhibitor.

Principal of GT Testing Kit

Mainty the organophosphate and carbamate pesticides are the cholinesterase inhibitors, so that the GT-KIT is base on the cholinesterase inhibition technique, and the safety limit means that the amount of the single toxic residue or the sum of several toxic residues on the one sample should not inhibit the function of the enzyme more than 50% (safety limit = <50% inhibition)

Efficiency of GT-KIT Detection limit as trichlorfon insecticide	0.05 mg/kg
1 ₅₀ % as trichlorfon insecticide	0.2 mg/kg
	Vegetables & Fruits
Sensitivity	92.3 %
Specificity	85.1 %
Accuracy	87.1 %
Positive predictive value	70.6 %
Negative predictive value	96.6 %

Method of sampling and sample preparation See the hand book

Sample extraction

- ➔ **Vegetables & fruits, low moisture** : Kale, Cabbage, Yard long beans etc. weigh 5 g. of the homegenize sample in to a sample bottle, pipette 5 ml. of the solvent-1 in to the sample bottle, shake vigorously 1 min. and leave for 15 mins. After that pipette 1 ml. of the sample extract in to a test tube and pipette 1 ml. of solvent-2 in to the same tube, then take to bvaporate the solvent-1.
- ➔ **Vegetables & fruits, high moisture** : Tomato, Orange etc. weigh 5 g. of the homegenize sample : 10 ml. or 2.5 g. sample : 5 ml. of solvent-1 in to a sample bottle, then follow as the above except pipette 2 ml. of sample extract : 1 ml. of solvent-2.
- ➔ **Midicinal plant**, 1 g. of the fresh sample : 10 ml. of solvent-1, 0.5 g. dried or powder sample : 10 ml. of solvent-1, then follow as the above.
- ➔ **Cereal grains, Dried beans and local vegetables (Pepper, Coriander etc.)** 2.5 g. : 10 ml. of solvent-1, then follow as the above.
- ➔ **Dry salted fish**, the sample weight and extraction are the same as vegetables & fruits, high moisture.
- ➔ **Soil and mud**, the sample weight and extraction are the same as vegetables & fruits, low moisture.
- ➔ **Water (Consumed & River water)**, 100 ml. of the sample : 5 ml. of solvent-1, after leave for 15 mins or until the two layers separated, pipette all of the sample extract (in the lower layer) : 1 ml. of solvent-2 (amount of sample = 100 ml./ml.)
- ➔ **Water from the contaminated area**, 30 ml. of the sample : 5 ml. of solvent-1, after leave for 15 mins or until the two layers separated, pipette 2.5 ml. of the sample extract (in the lower layer) : 1 ml. of solvent-2 (amount of sample = 15 ml./ml.)

Sample detection, result evaluation, sample disposal, cleaning of glassware and cautions : see the hand book

Composition of GT - Pesticide Residual Test Kit

Consist of 2 parts : Accessories : modified equipment

- Box case for all glassware 1 - Modified warm water tray 1 - Thermometer 1 - Evaporated 1 - Rack 1
- Pasteur pipette, glass 5 - Pasteur pipette, plastic 12 - Test tube 18 - Sample bottle, plastic 5 - Hand book 1

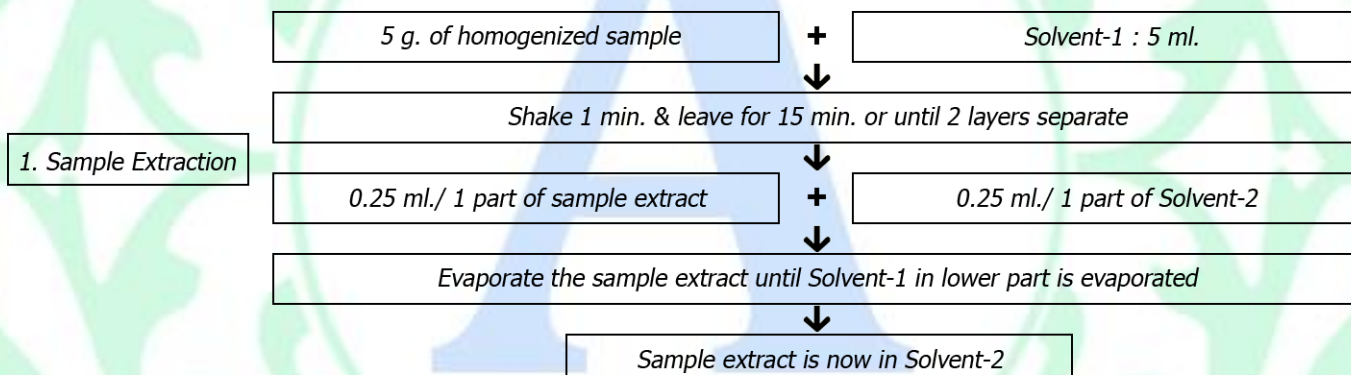
GT - reagents kit

1 set / 10 tests		1 set / 30 tests	
Solvent-1 : ~45 ml. 1	Solvent-2 : ~13 ml. 1	Solvent-1 : ~90 ml. 1	Solvent-1 : ~45 ml. 1
GT-1 : ~5.5 ml. 1	GT-2 + GT-2.1 (25 tests) 1	Solvent-2 : ~38 ml. 1	GT-1 : ~15 ml. 1
GT-3 + GT-3.1 (12 tests) 1	GT-4 : ~5.5 ml. 1	GT-2 + GT-2.1 (25 tests) 2	GT-3 + GT-3.1 (12 tests) 3
GT-5 : ~5.5 ml. 1		GT-4 : ~15 ml. 1	GT-5 : ~15 ml. 1

Storage of GT-reagent kit : Donot expose sunlight

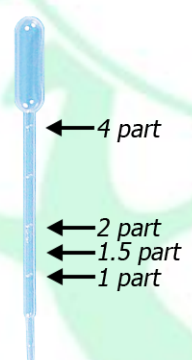
Item	Storage	Shelf life
Solvent-1	< 25 °C	About 1 year
Solvent-2, GT-2.1, GT-3, GT-3.1, GT-4, GT-5	< 25 °C	About 1 year
GT-1, for every day use	Refrigerator (2-10 °C)	About 1 month
GT-1, for spare use	Freezer (-10 to -18 °C)	About 1 year
GT-2	Freezer (-10 to -18 °C)	About 1 year
Mixture of GT-2 + GT-2.1	Refrigerator (2-10 °C)	About 10 days
Mixture of GT-3 + GT-3.1	Refrigerator (2-10 °C)	About 3-4 days

Flow Chart of Toxic Residues Detection



1. Sample Extraction

2. Toxic residues detection



	Cut point	Control	Sample	
	Solvent-2	Solvent-2	Sample Solution	
	1 part	1 part	1 part	
GT-1	2 part	2 part	2 part	Leave for 5 mins.
GT-2	1.5 part	1 part	1 part	Leave for 30 mins.
GT-3	4 part	4 part	4 part	
GT-4	2 part	2 part	2 part	
GT-5	2 part	2 part	2 part	Interpret the results

3. Result evaluation

Color in test tube	Results
Sample Tube \leq control tube	Not detected
Control Tube < Sample tube < Cut point tube	Detected, Safe for consumption
Sample Tube \leq Cut point tube	Detected, Unsafe for consumption