

## G9 TM Kit

(For detection of 2 pesticide compound residues in vegetables, fruits, Cereals and whole grain)

Pesticide compounds: **ORGANOPHOSPHATE AND CARBAMATE**

**Objective:** To detect pesticide compound residues (organophosphate and carbamate) in vegetables, fruits, and whole grain.

**Detection principle:** Separation of pesticide compounds by using TLC (Thin Layer Chromatography) and chemical reaction to form color. If sample contains Organophosphate and Carbamate substances, a white spot will be detected on purple background on the TLC sheet.

### Chemical substances:

1. Extraction solution 1 bottle
2. Testing solution 1. 1 bottle (keep refrigerator)
3. Testing solution 1.1 1 bottle (keep refrigerated)
4. TM 1 reagent 1 bottle (keep refrigerated)
5. TM 1.1 solution 1 bottle
6. TM 2 reagent 1 bottle (keep refrigerated)
7. TM 2.1 solution 1 bottle
8. TM 3 solution 1 bottle
9. Water 1 bottle
10. Charcoal powder 1 bag (Capsules)

### Testing equipment (inside the box)

1. TLC Sheet (-TM/1) 2 sheets
2. Plastic bottle with sprayer 2 bottles
3. Plastic dropper (3 ml) 2 tubes
4. Plastic dropper (1 ml) 1 tube
5. Glass dropper 10 tubes
6. Instruction manual 1 set

### Additional equipment needed

1. Warm water bath (with controlled temperature between A-37C and B- 48C with wire mesh rack)
2. TLC Tank
3. Metal cup
4. Bottle with dropper (for collecting sample)
5. Knife and cutting board (for cutting samples)
6. Forceps
7. TLC cover tray
8. Gloves
9. Stopwatch

### Preparation of Testing solutions

#### 1. Enzyme Solution

- 1.1 Take Testing solution 1 out of refrigerator and leave to obtain room temperature.
- 1.2 Pour Testing solution 1.1 into Testing solution 1 bottle, shake well and pour the mixture into spray bottle.
- 1.3 Put spray bottle in warm water bath at 37°C for at least 15 minutes before starting the test and keep the bottle there until the test is finished.

**Note:** Constant temperature control is essential for enzyme chemical reaction. Thus, mixture in spray bottle must be kept in

warm water bath throughout the testing procedure. After testing is completed, the rest of the mixture can be kept frozen and must be used within 3 days.

## 2. Color Testing Solutions

2.1 TM 1 Testing solution : Pour TM 1.1 solution into TM 1 reagent bottle and shake well to obtain TM1 solution.

2.2 TM 2 Testing solution: Pour TM

2.1 solution into TM 2 reagent bottle and shake well to obtain TM 2 solution.

2.3 In Testing procedure step 4 (Color test), mix GPO TM 1 Testing solution with TM2 Testing solution at ratio 1 ml : 4 ml and use immediately.

**Note:** TM 1 and TM 2 Testing solutions obtained from 2.1 and 2.2 must be kept in refrigerator at 2-8°C and can be used within 3 days.

**3. TLC Solution:** Pipet 10 ml of TM 3 solution into TLC Tank and leave at least 30 minutes before starting the test.

Sample	Preparation method	Quantity	Volume of Extraction Solution used (ml)
1 General vegetables and fruits such as Chinese kale, Chinese cabbage, cabbage, and yard long bean	Finely chopped	5 gram (approximate quantity at 4 <sup>th</sup> mark label of the bottle).	5
2 Juicy vegetables and fruits such as cucumber, tomato, orange	Coarsely chopped	2.5 gram (approximate quantity at 3 <sup>rd</sup> mark level of the bottle).	5
3 Whole grains such as dried beans, local vegetables such as coriander, parsley, neem, acacia, fingerroot, chili	Finely grinded	0.50 gm	5

## Testing Procedure and Extraction of Sample

1.1 Prepared sample in a bottle by following instruction directed in the below (do not use blender) and label code on each bottle

1.2 Add approximately 0.25 gm (1 capsule) of charcoal powder into sample bottle from 1.1 shake for 1 minute and leave for another 5 minutes to obtain complete extraction.



Use plastic dropper to draw 1 ml of extract from clear layer in 1.2 into a metal cup on the rack of warm waterbath and leave



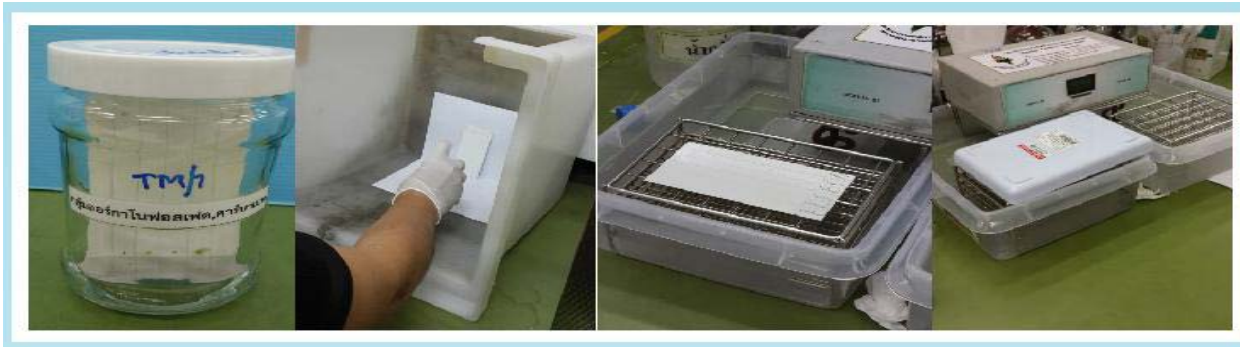
at 48°C until the solution is almost evaporated (2-3 drops left).

### 3. Testing procedure

3.1 Label names of samples to be tested on the upper end of TM/1 TLC sheet. Avoid direct hand touch to the sheet which may cause contamination of fat stain that can interfere the result interpretation.

3.2 Use capillary tube to draw extract from No.2. If extract in the cup is dried out, add another 2 drops of Extraction solution and lean the cup from side to side to dissolve the dried substance. Spot extract from capillary tip on the spot point (at the bottom end) on -TM/1 TLC sheet once, then raise the capillary up and wait to air dry, then repeat spotting for another 4-6 times until the extract in the capillary is finished.

3.3 Use forceps to pinch TM/1 TLC sheet into TLC Tank and gradually lean it against the inner wall, close the tank cover and leave stable to let the solution diffuse upward until reaches solvent front line. Then, open the cover and use forceps to take the sheet out and leave to air dry. Spray Testing Solution 1 over TM/1 sheet until surface is all wet and use forecept to lay the sheet facing up on warm water bath at 37°C and cover with tray for 10 minutes to obtain constant temperature.



3 Color Test After 10 minutes spray TM/1 TLC sheet from 3.3 with Color Testing Solution (prepared by mixing 1 ml of TM/1 Solution and 4 ml of TM/2 Solution from above) by leaving spray distance at 15 cm to allow complete absorption all over the sheet, then leave for 3 minutes and interpret the result.

### 5. Result Interpretation

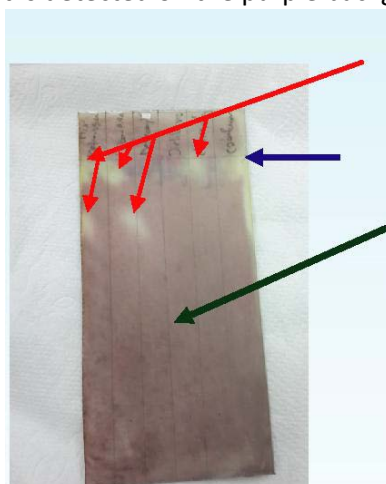


**Positive :** If white rounded spot is detected on the purple background on TM/1 TLC sheet, it means there are organophosphates and carbamate residues in the sample.

**Negative:** If no white rounded spot is detected on the purple background on TLC sheet, it means the sample contains no organophosphates and carbamate residues.

**Difference Pesticides**  
compound are detected

LoD read for



**Organophosphate and Carbamate Pesticides group ion**

## General vegetables, fruits and Cereals

Item	Name of Standard reagents	(LOD(mg/Kg))	RF Value (Standard Reagent)
1	Dicrotophos	0.126 mg/kg	0.09
2	Monochrotophos	0.118 mg/kg	0.17
3	Methomyl	0.663 mg/kg	0.67
4	Carbofuran	0.594 mg/kg	0.89
5	Diazenon	3.68 mg/kg	0.66
6	Dichlorvos	0.026 mg/kg	0.81
7	Carbaryl	0.597 mg/kg	0.91
8	Chlorfenvinphos	0.097 mg/kg	0.90
9	Profenofos	0.35 mg/kg	0.90
10	Chlopyrifos	1.79 mg/kg	0.09
11	Bendiocarb	0.597 mg/kg	0.90

### Cautions and Storage

1. The test should be conducted in airy room and avoid exposure to source of direct heat and flame.
2. All chemical substances are dangerous; avoid direct inhalation or direct contact.
3. In case of skin contact with chemical solutions, immediately wash with of water. In case of eye contact, immediately wash with plenty of water and seek immediate medical attention.
4. Keep the test kit out of reach of children and store in a place with good ventilation.

### Performance Characteristics

- Sensitivity 100 %
- Specificity 100 %
- Accuracy 86.7 %

**G9 Co., Ltd**

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