Pentachlorophenol (PCP)

RaPID Assay® is a rapid field or laboratory enzyme immunoassay method for the analysis of soil and water for remediation, assessment, and industrial testing.

Test result type

- Quantitative, semi-quantitative or qualitative

Samples per kit

- 100 test kit (tests up to 80 samples)

Assay range

- Soil: 0.1 ppm to 10 ppm as pentachlorophenol
- Water: 0.1 to 10.0 ppb as pentachlorophenol
- Other applications are also available
- Range can be extended with additional dilutions

Sample preparation

- Soil samples require prior extraction using the sample extraction kit (sold separately).
- The sample extraction kit provides materials for 12 soil sample extractions with alkaline methanol.

Sampling time

- Soil extraction time is typically two minutes per sample plus assay run time of approximately 60 minutes.

Specificity

- The PCP RaPID Assay® immunoassay test does not differentiate between PCP and other organochlorines. The table below shows compounds at the limit of quantitation (LOQ) - an approximate concentration required to yield a positive result at the lowest standard. The IC_{50} is the concentration required to inhibit one-half of the colour produced by the negative control. It is also used to calculate cross-reactivity values to similar compounds.

- » Rapid field testing procedure for analysis of soil and water samples
- » Quantitative data results with excellent analytical precision
- » Tests up to 50 samples at once
- » Results available in approximately 60 minutes
- » Magnetic particle immunoassay
- » Training available
- » EPA SW-846 method #4010

PCP IN SOIL (PPM)

Contaminant	LOQ	IC_{50}
Phenanthrene	0.20	1.65
Fluoranthene	0.057	0.47
Benzo(a) pyrene	0.084	0.69
Pyrene	0.093	0.77
Chrysene	0.095	0.78
Anthracene	0.133	1.10
Indeno(1,2,3.c,d) pyrene	0.33	2.72
Benzo(a) anthracene	0.344	2.84
Fluorene	0.43	3.52
Benzo(b) fluoranthene	0.66	5.42
Acenaphthylene	5.42	44.7
Benzo(k) fluoranthene	6.35	52.4
Acenaphthalene	8.3	68.8
Benzo(g,h,i) perylene	>12.12	>100
Naphthalene	>12.12	>100
Dibenzo(a,h)anthracene	>12.12	>100

Basic Test Procedure

- Add prepared sample, enzyme conjugate, and antibody coupled magnetic particles. Vortex
- Incubate for 30 minutes
- Separate using the RaPID magnetic separator, decant and wash
- Add colour solution and incubate for 20 minutes
- Stop the reaction and read colour at 450 nm
- Quantitive results and QC parameters are calculated and printed automatically using the Smart Reader Photometer and Rugged Tablet

Other recommended materials

» Latex gloves
» Liquid and solid waste containers
» Calculator
» Absorbant paper for blotting
» Marking pen

p = purchase, r = rental

Test kit components

» Antibody coated magnetic particles for analysis of 100 test tubes
» Zero standard, wash, enzyme conjugate, colour development and stop reagents
» Standards for 0.1, 2 and 10 ppb as PCP
» Kit control as 1.0 ppb as PCP
» Disposable test tubes
» Test kit instructions

Storage & precautions

» Shelf life is typically one year from date of manufacture, with specific kit expiration date information provided on product packaging.
» Reagents must be stored at 39° to 46°F (4° to 8°C) when not in use
» Store at ambient temperature 64° to 81°F (18° to 27°C) for up to eight hours
» Kits must be brought to 64° to 81°F (18° to 27°C) before use
» Do not expose colour solution to direct sunlight
» Portable spectrophotometer battery should be charged prior to use

Required test materials	Part #
» PCP 100 tube test kit	A00111
» Sample extraction kit	A00128EA
» PCP sample diluent (as needed)	A00113

Required test equipment

» RaPID Assay accessory kit which contains:	6050100 (p) 6997010 (r)
» RPA-II RaPID analyser	6000111
» Magnetic separation rack	A00004
» Repeator pipet	A00008
» Adjustable volume pipet	A00176
» Vortex mixer	A00014
» Portable balance	A00131
» Digital timer	A00015
» Repeator pipet tips	A00009
» Adjustable pipet tips	A00013