



Glyphosate, glufosinate and AMPA in water

Glyphosate contamination of the environment is growing because of increasing use of glyphosate-based pesticides, which brings up the need of their constant analysis. The most common pesticide compounds are glyphosate, ammonium glufosinate and glyphosate degradation product – AMPA. Glyphosate is for example distributed under the trade names: Roundup, Touchdown, Buccaneer, Razor Pro, Genesis Extra II, Rodeo, Aquaneat, Aquamaster.

ALS Czech Republic developed an efficient LC/MS/MS method to determine glyphosate based pesticides in surface, ground and drinking waters.

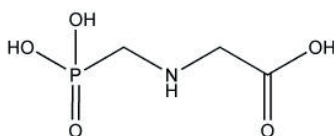


The following parameters are included in the method:

Herbicide	CAS	LOQ
Glyphosate	1071-83-6	0,1 µg/l
Ammonium glufosinate	77182-82-2	0,1 µg/l
AMPA	1066-51-9	0,1 µg/l

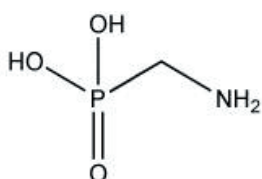
Glyphosate (N-(phosphonomethyl) glycine)

- Broad-spectrum systematic non-selective herbicide
- Regulate growth of plants and destroy weeds in both agricultural and barren areas and in forests
- Strongly adsorbed on soil particles, low soil mobility.
- Found in water when pesticides were applied close to open water surfaces (in concentration levels higher than µg/l)
- The effect of glyphosate is fast, it is moderately persistent with half-life ranging from 12 hours to 7 months.
- Glyphosate degrades microbiologically; aerobic degradation is faster than anaerobic.



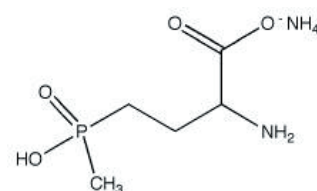
AMPA (aminomethyl)phosphonic acid

- Main degradation product of glyphosate
- Not commercially used
- Similar structure and properties like glyphosate



Glufosinate ammonium

- Less used than glyphosate
- Broad-spectrum non-selective herbicide
- Used to destroy weeds in agricultural (fruit orchards, vineyards, tea plantations or vegetable fields) and barren areas



Toxicity and legislative demands

- According to US EPA, Glyphosate-based pesticides are classified into the class of toxicity III
- Recent studies have shown that glyphosate-based pesticides in presence of other compounds can be teratogenic

Method

- Method based on FMOC-Cl (9-fluorenylmethyl chloroformate) derivatization, extraction by SPE (solid phase extraction) and consequent separation and detection of analytes
- Determination performed by modern LC/MS/MS technique (ESI/Triple Quad)
- HPLC Agilent 1100 Series and mass spectrometer API 4000 (Applied Biosystems)
- Confirmation of each analyte by two MRM transitions (Commission Decision 2002/657/EC)
- Quantification of analytes based on external standard
- Extraction recovery corrected by isotopic labeled internal standards
- Suitable for drinking surface and ground waters
- Limit of quantification for each analyte at 0,1 µg/l



Delivery time

Routine delivery time from the samples receipt to results reporting is 7-10 days.

Contact us for further details

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Legislation

The European Union directive (98/83/EC) on the quality of water intended for human consumption declares maximal acceptable concentrations for particular pesticides and their metabolites to 0,1 µg/L while sum of all pesticides and metabolites must not exceed the value of 0,5 µg/L.



Sample containers and volume

The routine analysis requires a volume of 40 ml minimally (EN ISO 5667-3). ALS provides the clients with 150 and 250 ml bottle free of charge.

Storage and transport conditions

Samples must be stored in the dark at temperature from 1 to 5 °C. Special thermo boxes are used for transportation.

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