

The treatment glyphosate in surface water by photocatalytic TiO_2 SiO_2 and n- TiO_2 ...

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Glyphosate is a broad-spectrum systemic herbicide and crop desiccant.

Glyphosate was the most used herbicide in the United States' agricultural sector and the second-most used in home and garden, government and industry, and commercial applications. This study applied a very popular treatment method that is using the photocatalytic activity of the material TiO₂/TiO₂ doped to treatment glyphosate in surface water under different conditions. Firstly, study compared glyphosate decomposing under different flow rates of 0.5 mL/s, 1 mL/s, 1.5 mL/s and 0.5 mL/s is the speed to bring the best processing effect. Then use speed of 0.5 mL/s for processing under different lighting conditions.

Under UV light and fluorescent light conditions, after 4 hours lighting Glyphosate degradation efficiency is obtained is 70- 80%. Similarly, 80-90% is also capable of decomposing glyphosate under sunlight. Finally, the study was applied to treat the glyphosate content in the actual sample taken from the wastewater from the garden in Minh Khai commune, Bac Tu Liem District and the result was 70% of the glyphosate concentration treated in the actual sample, after 4 hours. From experiments it can be seen that the TiO₂ material is capable of decomposing glyphosate in surface water and depending on the different conditions. Key words: Glyphosate, TiO₂/TiO₂ doped, photocatalyst, UV light, fluorescent light, sunlight.

Glyphosate is odorless white powder. Decomposition begins at approximately 419°F Glyphosate is a broad-spectrum systemic herbicide and

crop desiccant. It features high efficiency control of annual and perennial weeds. Glyphosate was the most used herbicide in the United States' agricultural sector and the second-most used in home and garden, government and industry, and commercial applications. Glyphosate have been approved by regulatory bodies worldwide, concerns about their effects on humans and the environment persist, and have grown as the global usage of glyphosate increases. The worldwide use of this herbicide requires the special concerns with its ill effects on environment and human beings. This chemicals enter the soil in different ways i. e. with washing of remaining deposits on crops by rain or irrigation water and incorporated with crop residues. All these processes influence the extent of surface and ground water contaminations. Various adverse effects of glyphosate including teratogenesis, carcinogenesis, mutagenesis and other developmental effects.

Advantage

Unlike many herbicides, glyphosate gets absorbed by the particles in your dirt and immediately starts to break down into natural, nontoxic substances, meaning it has a very low rate of persistence. The average half-life of glyphosate was only 40 days. This means that after just 40 days, half of the glyphosate had dissipated, which is a much lower persistence rate than many other herbicides.- Compared to many other kinds of herbicides, pure glyphosate is very low in toxicity to peoples. This may make it much safer than other chemicals may be tempted to use in the garden and lowers your risks of health problems related to herbicide exposure.

Glyphosate belongs to the poison group III, the toxicity to the user is lower than Gramaxone herbicides (Group II), LD50 = 4, 900 mg / kg-Glyphosate is a broad-spectrum herbicide for annual and perennial weeds. Glyphosate typically kills weeds within 2 to 10 days, thereby helping to increase yields and productivity. Glyphosate may also save you time and effort compared to traditional hand or mechanical weeding. Glyphosate destroys all plant parts by traveling from the leaves to the roots. It is useful for controlling perennial weeds, which regrow from their roots every year, and for controlling weeds without having to dig them up.

Disadvantage

Everything from the soil temperature and soil pH levels to general weather can raise or lower glyphosate's persistence rate. For example, in the previously mentioned manufacturer's study, while the average half-life was just 40 days, one test site's half-life was more than 141 days. When glyphosate persists in the soil, it can kill or injure any other plants that you're trying to grow in the area long after you have sprayed your garden with glyphosate.

Glyphosate Is Still Toxic

While glyphosate may be comparatively low in toxicity when judged next to other herbicides, it is still toxic. Exposure to glyphosate can cause skin irritations, difficulty swallowing, diarrhea and vomiting, warns the National Pesticide Information Center. When handling glyphosate, wear protective gear. This includes rubber gloves, a face mask, protective goggles and clothing that covers your arms and legs. The National Pesticide Information

Center also warns that although pure glyphosate has low toxicity, herbicide manufacturers often combine it with surfactants and other chemicals, and these chemicals may increase people health risks. Always read the manufacturer's labeled guidelines and warnings.