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GEOGRAPHICAL INDICATIONS



सत्यमेव जयते

GOVERNMENT OF INDIA  
THE PATENT OFFICE  
PATENT  
(RULE - 74)

No. D - CHE/0561

No. 200767

of

22/01/2004

Whereas INDIAN INSTITUTE OF TECHNOLOGY, IIT P.O. CHENNAI 600 036, TAMIL NADU, INDIA, AN AUTONOMOUS BODY SET UP BY THE GOVERNMENT OF INDIA UNDER AN ACT OF PARLIAMENT

has/have declared that he is/they are in possession of an invention for  
A METHOD OF PREPARING DRINKING WATER WITH PESTICIDE CONTENT 0.1 PPM AND BELOW  
AND DRINKING WATER PREPARED BY THE SAID METHOD

and that he is/they are the true and first inventor(s) thereof (or the legal representatives(s) or assignee(s) of the true and the first inventor(s)) and that he is/they are entitled to a patent for the said invention, having regard to the provisions of the Patents Act, 1970, as amended and that there is no objection to the grant of a patent to him/them.

And whereas he has/they have, by an application, requested that a patent may be granted to him/them for the said invention;

And whereas he has/they have by and in his/their complete specification particularly described the said invention and the manner in which the same is to be performed;

Now, these present(s) that the above-said applicant(s) (including his/their legal representative(s) and assignee(s) or any of them) shall, subject to the provisions of the Patents Act, 1970, as amended and the conditions specified in Section 47 of the said Act, and to the conditions and provisions specified by any other law for the time being in force, has/have the exclusive right to prevent third parties from making, using, offering for sale, selling or importing for those purposes the product in India/using the process and using, offering for sale, selling or importing for those purposes the product obtained, if any, directly by that process in India, for a term of twenty years from the 22nd JANUARY 2004 and of authorizing any other person to do so, subject to the conditions that the validity of this patent is not guaranteed and that the fee prescribed for the continuance of this patent is duly paid.

In witness thereof, the Controller has caused this patent to be granted as of the SECOND day of JUNE, 2006.

Date of Grant : 02/06/2006

Controller of Patents

Prof T. Pradeep : SAIF



**THE PATENTS ACT 1970**

**COMPLETE SPECIFICATION**

**SECTION 10**

**A METHOD OF PREPARING DRINKING WATER**

**INDIAN INSTITUTE OF TECHNOLOGY, IIT P.O.  
CHENNAI 600036, TAMIL NADU, INDIA, AN  
AUTONOMOUS BODY SET UP BY THE GOVERNMENT  
OF INDIA UNDER AN ACT OF PARLIAMENT**

**THE FOLLOWING SPECIFICATION PARTICULARLY  
DESCRIBES THE NATURE OF THIS INVENTION AND  
THE MANNER IN WHICH IT IS TO BE PERFORMED**

SI / 0461 2004  
22.1.2004

25 JAN 2005

ORIGINAL

**This invention relates to a method of preparing drinking water with pesticide content (Chlorpyrifos and Malathion) 0.1 ppm and below and drinking water prepared by the said method.**

**It is well known that water taken out from the subsoil through bore wells and the like usually contain pesticides at a level, which is harmful for human consumption.**

**However, such water will be acceptable for drinking purposes if the pesticide content is reduced to acceptable levels.**

**This invention, therefore, proposes a method as aforesaid which is simple, yet effective.**

**The method, according to this invention, for preparing drinking water with pesticide content 0.1 ppm and below, comprising the steps of making nanoparticles (2 – 150 nm diameter) of Gold and/or Silver, followed by soaking alumina globules of average diameter 0.5 cm in a solution of the nanoparticles of concentration  $10^{-3}$  moles/litre (concentration of metal ion used) thereby depositing the nanoparticles on the surface of the said globules ; washing the globules with the nanoparticles deposited thereon, in water; soaking about 1000 globules in 1 litre of the pesticide containing water to effect the pesticide adsorption on the nanoparticles and thus lower the concentration of the pesticides in the water to 0.1 ppm and below; the globules being separated thereafter from the water, by means such as filtration.**

### **EXAMPLE**

**Nanoparticles of metals selected (Silver, Gold) are prepared in the known way.**

**Alumina ( $\text{Al}_2\text{O}_3$ ) globules of average 0.5 cm diameter are soaked in a solution of the nanoparticles in water of concentration  $10^{-3}$  moles/litre (concentration of the metal ion used) for 6 hours to deposit the nanoparticles on the surface of the said globules. The globules are then washed with water.**

**About 1000 globules are then mixed with 1 litre of the water to be treated to cause the pesticides in the water to be adsorbed by the nanoparticles and thus lower the concentration of the pesticides in the water to 0.1 ppm and below. The globules are separated thereafter from the water by filtration.**

**The method described above is applicable to the pesticides chlorpyrifos and malathion.**

**The terms and expressions herein are of description and not of limitation, having regard to the scope and ambit of this invention. The concentration limit described above is not the limitation of the process, but that of the detection methodology applied.**

We Claim :

1. A method of preparing drinking water with pesticide content 0.1 ppm and below comprising the steps of making nanoparticles (2 - 150 nm diameter) of Gold and/or Silver, followed by soaking alumina globules of average diameter 0.5 cm in a solution of the nanoparticles of concentration  $10^{-3}$  moles/litre (concentration of metal ion used) thereby depositing the nanoparticles on the surface of the said globules ; washing the globules with the nanoparticles deposited thereon, in water; soaking about 1000 globules in 1 litre of the pesticide containing water to effect the pesticide adsorption on the nanoparticles and thus lower the concentration of the pesticides in the water to 0.1 ppm and below; the globules being separated thereafter from the water, by means such as filtration.
2. A method of preparing drinking water with pesticide content 0.1 ppm and below substantially as herein described and illustrated by the Example.
3. Drinking water whenever prepared by a method as claimed in any one of the preceding Claims.

Dated this the 22<sup>nd</sup> day of January 2004.



KAMATH & KAMATH  
APPLICANTS' ATTORNEY

Abstract  
51/CHE/2004

A method of preparing drinking water with pesticide content 0.1 ppm and below comprising the steps of making nanoparticles (2 – 150 nm diameter) of Gold and/or Silver, followed by soaking alumina globules of average diameter 0.5 cm in a solution of the nanoparticles of concentration  $10^{-3}$  moles/litre (concentration of metal ion used) thereby depositing the nanoparticles on the surface of the said globules ; washing the globules with the nanoparticles deposited thereon, in water; soaking about 1000 globules in 1 litre of the pesticide containing water to effect the pesticide adsorption on the nanoparticles and thus lower the concentration of the pesticides in the water to 0.1 ppm and below; the globules being separated thereafter from the water by means, such as, filtration.

We Claim :

1. A method of preparing drinking water with pesticide content 0.1 ppm and below comprising the steps of making nanoparticles (2 - 150 nm diameter) of Gold and/or Silver, followed by soaking alumina globules of average diameter 0.5 cm in a solution of the nanoparticles of concentration  $10^{-3}$  moles/litre (concentration of metal ion used) thereby depositing the nanoparticles on the surface of the said globules ; washing the globules with the nanoparticles deposited thereon, in water; soaking about 1000 globules in 1 litre of the pesticide containing water to effect the pesticide adsorption on the nanoparticles and thus lower the concentration of the pesticides in the water to 0.1 ppm and below; the globules being separated thereafter from the water, by means such as filtration.
2. A method of preparing drinking water with pesticide content 0.1 ppm and below substantially as herein described and illustrated by the Example.
3. Drinking water whenever prepared by a method as claimed in any one of the preceding Claims.

Dated this the 22<sup>nd</sup> day of January 2004.



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