

Coronavirus | Ex-panchayat chief from Tiruvallur designs low-cost method to produce disinfectant



Mr. Elango, a chemical engineer by qualification, has designed the unit in two different capacities, a 25-litre barrel and a 210-litre barrel. | Photo Credit: Special arrangement

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R. Elango, a former scientist at Council of Scientific and Industrial Research (CSIR), shows how to make sodium hypochlorite using solar power. R. Elango, a former scientist at Council of Scientific and Industrial Research (CSIR), who later served as the president of Kuthambakkam panchayat in Tiruvallur district, has come up with a design to **manufacture sodium hypochlorite using solar** power in a decentralised manner.

Considering that sodium hypochlorite is the **disinfectant widely** used in various concentrations depending on the purpose, he says the design can be used to meet the current surge in demand for the **disinfectant in the fight against COVID-19**.

“Right from floor cleaners and toilet cleaners to sprays used widely now for disinfecting public places is sodium hypochlorite, **which is the mother of all disinfectants. It is commonly manufactured in industries through electrolysis,**” he says. Explaining the process, Mr. Elango, who is a chemical engineer by qualification, says sodium hypochlorite is made in industries by the simple process of **passing electricity through titanium electrodes immersed in sodium chloride (salt) solution.**

#### High demand for disinfectants

Mr. Elango replaced the conventional source of electricity with a 1 kilowatt capacity solar panel. With the high demand for disinfectants, he highlights that the conservation of non-renewable power would be huge.

“In a barrel fitted with the electrodes, one has to fill salt water solution in high concentration and pass the solar-generated power. In about eight hours, you can get sodium hypochlorite from a tap attached to the barrel.” For now, he has designed the unit in two different capacities of a 25-litre barrel and a 210-litre barrel. 25 litres of sodium hypochlorite can be diluted to 100 litres for disinfecting drainages, to 150 litres for floor cleaning and to 500 litres for applications like cleaning utensils, he claims.

These units can be easily set up in open at the village or town-level to meet the local demand. “It is a completely safe process. The electricity used is of very low voltage. There is absolutely no byproduct or other waste that needs to be handled,” he says.

#### Steep initial costs

According to him, while the 25-litre capacity unit will cost about ₹ 60,000 to set up, the 210-litre capacity will cost around four to five times more. **V.P. Jayakumar, managing director of Tiaano,** a chemical company, who helped Mr. Elango in assembling the electrodes in the unit, said excluding the initial cost to set up the unit, one litre of sodium hypochlorite can be produced at a cost of 0.05 paise. “This is inclusive of employing a person for ₹500 per day. The input will just be 750 g of salt in 25 l of water for one cycle.”

“Floor cleaners we buy from supermarkets cost around ₹85 for just 300 ml,” he adds. Mr. Elango says it can also become a business model for villages to generate revenue. Mageswari Ravikumar, Collector, Tiruvallur, who inspected the design, says the district would soon set up a unit on an experimental basis.

Refer: <https://www.thehindu.com/news/cities/chennai/coronavirus-ex-panchayat-chief-from-tiruvallur-designs-low-cost-method-to-produce-disinfectant/article31400466.ece/amp/>

# CSIR lab defends sanitisation tunnel after ministry's advisory



**Shoumojit Banerjee**

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## **Advisories advocating against use of sanitisation tunnels lack scientific basis, say CSIR-NCL, ICT**

In the wake of several advisories advocating against the use of sanitisation tunnels as part of efforts to contain the spread of the novel coronavirus, the Pune-based CSIR-National Chemical Laboratory (CSIR-NCL) and the Mumbai-based Institute of Chemical Technology (ICT) issued a joint statement on Thursday asserting that the advisories “did not have any scientific basis”.

“Efficacy of sodium hypochlorite, also known as hypo or bleach, ranging from 0.02% to 0.05% weight concentration was studied on personnel walking through mist tunnel unit besides antibacterial activity against standard microorganisms before and after exposure in the walk-through,” the CSIR-NCL and ICT said in a release. “Results indicated that [sodium hypochlorite used in this weight concentration range] did not show any adverse effects on the skin. Thus, we recommend using 0.02% to 0.05 wt. % sodium hypochlorite solution (200 to 500 ppm) for external body surface sanitisation of personnel walking through the mist tunnel by following standard safety precautions,” the two scientific establishments added.

The ministry had made clear that the spraying [of disinfectant] on individuals or groups was “not recommended under any circumstances” and that even if a person was potentially exposed to the novel coronavirus, spraying the external part of the body did not guarantee killing the virus that had entered one's body.

“Also, there is no scientific evidence to suggest that they are effective even in disinfecting the outer clothing in an effective manner,” the Health ministry noted in its advisory. “Spraying of chlorine on individuals can lead to irritation of eyes and skin... Inhalation of sodium hypochlorite can lead to irritation of mucous membranes to the nose, throat, respiratory tract and may also cause bronchospasm,” it cautioned, while observing that the use of such measures could in fact “lead to a false sense of safety and actually hamper public observance to hand washing and social distancing measures”.

Reacting to media reports that mist tunnels in some cases were found to have caused rash and irritation on the people passing through them and that it gave a false sense of safety to people, Ashwini Kumar Nangia, Director CSIR-NCL and A. B. Pandit, Vice-Chancellor, ICT Mumbai,

said the issue was one of implementing the prescribed guidelines. “There is a correct procedure for everything. There are reports that in some places 2 wt.% sodium hypochlorite solution was used, which is 40-100 times more concentrated than what we are recommending, while in some cases people had prepared 1 wt.% hypo solution by diluting the stock solution 100 times, not knowing that the commercial chemical is 5-8 wt. % solution and has to be diluted accordingly. The scientific data of CSIR-NCL and ICT clearly show that there is a beneficial killing effect of bacteria and microbes at 0.02-0.05 wt.% hypo” they said.

Clarifying that the mist spray was for external body and clothing sanitisation only, the two officials said that the scientific reports would be submitted to government and health authorities for consideration on merit and immediate implementation.

CSIR-NCL further recommended the use of ‘face shields’ or ‘safety goggles’ during the walk-through which could then be recycled after further disinfection. The walk-through is recommended to be followed by a hand wash using soap or hand-sanitisers to complete the process.

Also, for optimal effects, CSIR-NCL further recommended different concentrations of hypo depending on the nature of exposure to personnel.

“A hypo solution with 0.05% weight concentration is suggested for those exposed to a large population such as health workers, municipal employees and police authorities and 0.02% weight concentration for those in normal office spaces like inside office or factory,” the two establishments said, while not advocating it for those in completely isolated places like homes.

In the section on ‘cleaning practices’ which was part of a technical brief on ‘water, sanitation hygiene and waste management for the COVID-19 virus issued by the World Health Organization on March 3, it had recommended the usage of sodium hypochlorite at 0.5% (equivalent to 5,000 ppm) for disinfecting surfaces, and 70% ethyl alcohol to disinfect small areas between uses, such as reusable dedicated equipment like thermometers.

## **REFER:**

**[HTTPS://WWW.THEHINDU.COM/NEWS/NATIONAL/CSIR-LAB-DEFENDS-SANITISATION-TUNNEL-AFTER-MINISTRYS-ADVISORY/ARTICLE31417722.ECE](https://www.thehindu.com/news/national/csir-lab-defends-sanitisation-tunnel-after-ministrys-advisory/article31417722.ece)**