

# LOW COST ADSORBENT FOR WATER TREATMENT



## INVENTION

Agricultural by-product (Jute stick) was used as a raw material to produce activated carbons. The carboxylated Jute Stick Activated Carbon (JSAC-COO) were used as low-cost adsorbent for removing harmful lead from water.

## MARKET SIZE AND GROWTH

- Due to increasing demand for activated carbon, raw materials used in its synthesis are in short supply and hence more expensive.
- Because of the strict regulations for a rising number of municipal water treatment plants, the demand for activated carbon has soared.
- The removal of lead ions ( $Pb^{2+}$ ) from drinking water at an affordable price is a challenge.
- The global activated carbon market was valued at USD 4.7 billion in 2015 and is projected to reach USD 8.1 billion by 2021 (ACTIVATED CARBON MARKET REPORT).
- Powdered activated carbon is a market category with the highest growth rate in the activated carbon industry.

## APPLICATIONS

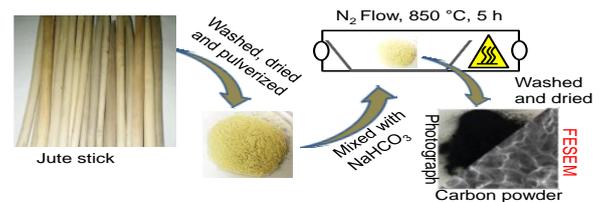
Heavy metals such as lead, magnesium, and a variety of other hazardous pollutants can be absorbed by activated carbon for domestic and industrial water treatment process.

## ADVANTAGES

- Within 15 minutes of contact time, up to 99.8 percent of  $Pb^{2+}$  was removed
- The adsorption capacity is more than 25.0 mg  $Pb^{2+}$ /g of JSAC-COO
- The lead ions can be removed quickly and easily

## PROJECT STATUS

- JSAC-COO was evaluated for  $Pb^{2+}$  concentrations (10 and 25 mg/L) at varied pH (4.0 and 7.0), temperature (15 and 27 °C), and contact times (1, 5, 10, 15, 30, and 60 min).
- All the tests were performed as per the U.S. EPA (1998)-Principles of Environmental Impact Assessment



## LOOKING FOR DEVELOPMENT PARTNER

- We are looking for an industrial partner who can scaleup the technology and validate it at a large scale facility.
- Our researchers can work with the industrial experts in refining the composition and its method of preparation as best suited for large scale industrial manufacturing standards.

## PATENT PROTECTION

A US patent application [16/525949](#) covers composition and method of preparation of activated carbon. The intellectual property is owned by King Fahd University of Petroleum & Minerals (KFUPM).

## ABOUT KFUPM

KFUPM was established in year 1963 and is located in Dhahran city of Saudi Arabia. KFUPM currently ranks at 163 in QS World University Rankings 2022. KFUPM's Innovation & Technology Transfer office strives for taking innovation from lab to marketplace.

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