REDUCTION OF ORGANOPHOSPHOROUS PESTICIDES CONTAMINATION IN AQUEOUS SOLUTION USING WASTE JUTE FIBER

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ISBN-13: 978-81-931580-7-4
FIRST EDITION, JUNE 2016, INDIA

Typeset, Printed & Published by:
VSRD Academic Publishing (*A Division of Visual Soft (India) Pvt. Ltd.*)

Printed & Bound in India

VSRD ACADEMIC PUBLISHING
A Division of Visual Soft (India) Pvt. Ltd.

REGISTERED OFFICE
154, Tezabmill Campus, Anwarganj, KANPUR – 208 003 (UP) (IN)
Mob.: +91 99561 27040, Ph.: +91 512 6553705
Web.: www.vsrdpublishing.com, Email: vsrdpublishing@gmail.com

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Basement-2, Villa-10, Block-V, Charmwood Village, FARIDABAD–121009 (HY)(IN)
Mob.: +91 98999 36803, Ph.: +91 129 4036803
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MARKETING OFFICE (SOUTH INDIA)
340, FF, Adarsh Nagar, Oshiwara, Andheri(W), MUMBAI–400053 (MH)(IN)
Mob.: +91 9956127040
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PREFACE

The indiscriminate use of Organophosphorous pesticides (OPPs) in agricultural sector has caused several environmental problems. Investigation of removal of OPPs is of great importance in the environmental point of view. In this book, we focused on the sulphuric acid activated carbon prepared from agricultural "Waste" Jute Fiber. Chemically activated "Waste" Jute Fiber is effectively used for the removal of five selected OPPs such as methylparathion, malathion, monocrotophos, phosphamidon and dimethoate from aqueous solution. The "Waste" Jute Fiber is a non-toxic and an inexpensive material obtained as agricultural byproduct. We presented the characterization of Jute Fiber Carbon (JFC) by using elemental analyzer and proximate analysis methods in this book. Batch adsorption study is carried out to investigate the adsorption equilibrium, kinetics and thermodynamics as a function of agitation time, initial concentration of pesticides, initial pH, temperature and carbon dose. Adsorption data are used to perform the first and second kinetic models. The adsorption of methylparathion, malathion and monocrotophos follow the first order kinetics and phosphamidon and dimethoate follow the pseudo second order kinetics. The adsorption data for all the five OPPs are found to obey Langmuir adsorption isotherm. Thermodynamic parameters such as ΔG, ΔS and ΔH are calculated and the negative value indicates the exothermic and spontaneous nature of the adsorption process. The diffusion of the pesticide molecules onto carbon is confirmed by using Weber – Morris model. The single stage batch adsorber model is designed by using Langmuir adsorption isotherm data for the removal of pesticides. Further, in continuation of batch studies results, column studies will be carried out in future.

✍ *Dr. S. Senthilkumaar*

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