

2nd Euro Global Summit and Expo on

BIOMASS AND BIOENERGY

October 12-13, 2017 London, UK

Applications of waste biomass in removal of pesticides from waste water

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The use of pesticides in agriculture has augmented significantly in recent years for protection of crops from pest organisms. The discharge of pesticides into water bionetwork from industrial and agricultural wastewaters creates severe ecological issues and badly effects on human and animal health. In view of the fact that most pesticides are used in open surroundings such as ploughed fields; their residues comprise main pollution risks to the world drinking water supplies. There is a need of effectual methods for the treatment of water contaminated with pesticides. Treatment processes like chlorination may even worsen the problem by producing unidentified intermediates and contributing to the antimicrobial resistance problem. Adsorption techniques are extensively accepted for the amputation of dyes, metals and petrochemical products from water. However, manufacture and renewal expenses of a number of adsorbents such as activated carbon are very high. Agriculture waste materials such as sawdust, shed leaves of plants, nut shells, etc. are the most promising alternative bio-adsorbents. These adsorbents have already proved effective in removal of formaldehyde, phenol and pharmaceuticals from ground and surface waters. Moreover these are cheap, non-toxic, environmentally-friendly and readily-available resources. The uptake of pollutants by these materials can be enhanced by combining adsorption and formation of covalent bonding between the cellulose backbone and the pesticide molecules. This can be achieved through formation of chelate complexes of cellulose, bivalent metals and pesticides. The metal ions coordinate with functional groups of pesticides and hydroxyl groups of cellulose, forming insoluble derivatives. This aims to develop a new effective process to reduce concentrations of selected pesticides in water.

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