

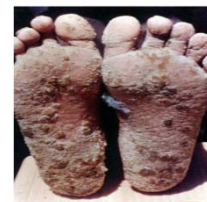


Novel poultry feather filter for arsenic contaminated water

Muhammad Khosa and Aman Ullah

RELEVANT FACTS AND FIGURES

- Arsenic (As) poisoning (a medical condition) is caused by elevated levels of arsenic in the body
- The pathway of arsenic poisoning is ground water containing high concentrations of arsenic
- 140 million people in more than 70 countries are affected by arsenic poisoning
- Several thousand deaths per year in Bangladesh are caused by arsenic related diseases
- Prolonged use of arsenic contaminated water causes cancer affecting skin, lungs, and kidneys
- Poultry feather is composed of protein known as keratin (also found in skin, hair, nails and horns)



PROJECT OBJECTIVE

- ✓ Modification of chicken feathers (CF)
- ✓ Characterization of modified CF
- ✓ Preparation of arsenic removal filters using chemically modified material

PROBLEM

- As is an environmental contaminant i.e. soil, groundwater and plants.
- As enters water through a combination of natural sources and anthropogenic activities.
- Activated alumina, carbon, iron oxide sands, metal loaded resins and bauxol have been used to remove As from H₂O; they are expensive and/or inefficient at removing As(III).

POTENTIAL BENEFITS

- Utilization of modified chicken feathers (CF) as biosorbent to remove arsenic has several social, economic and environmental benefits
- ❖ Development of biodegradable and environmentally friendly filters;
- ❖ Saving lives of millions of people in developing countries by reducing risk of arsenic poisoning and improving the well-being of the affected population
- ❖ Creating new “green” industry and providing jobs at grassroots level

MODIFICATION

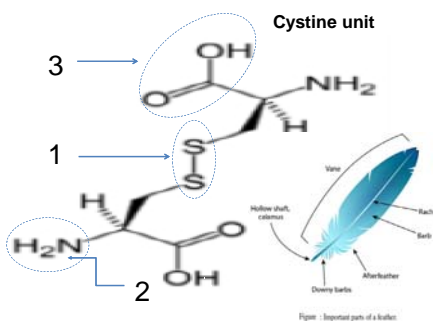
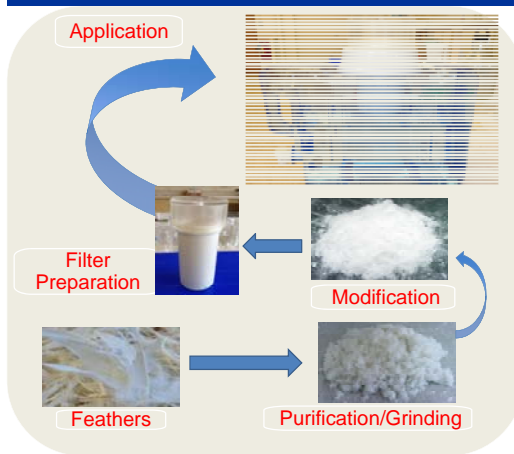


Figure 1: 1-disulfide; 2-NH₂; 3-COOH groups

OUR APPROACH



CONCLUSIONS

- ✓ Successful modifications of CF
- ✓ Successful filtration of As (III)
- ✓ Designing of MCF supported filter

RESULTS AND DISCUSSION

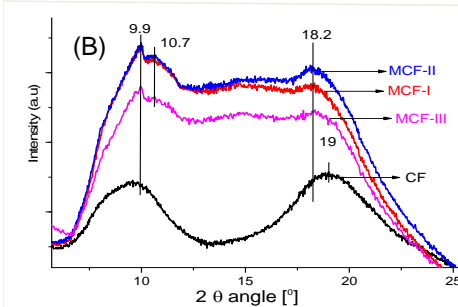
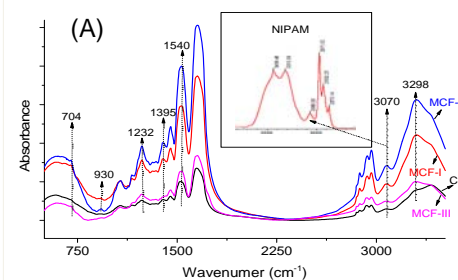


Figure 2: (A) FTIR (B) XRD of CF and MCF

SORPTION CAPACITY OF MCF

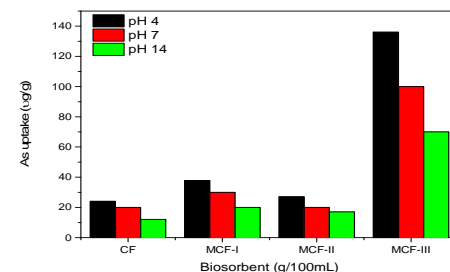


Figure 3: As sorption capacity of CF& MCF

Contact Information

Aman Ullah, Assistant Professor, AFNS
 Phone: (780) 492-4845, E-mail: amanullah@ualberta.ca

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