RemovAs
Development of an Arsenic Removal Device to Treat Drinking Water using Locally-Sourced Materials and Appropriate Technology

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En collaboration avec San Diego University (USD)

Objective:
Test banana peel as a sorbent material to remove arsenic from polluted freshwater, in an ecofriendly and low cost process

Eccorev 2018

Experimental methodology

1. Sorbent material preparation

organic banana → eat → *peel cut in 5x5 mm* → heat 105°C → *coarse material* → grinding 1' or 5" → *fine material*




2. Sorbent material test

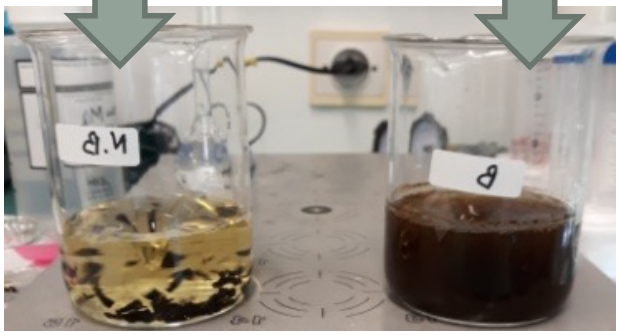
on arsenic removal from water

Studied parameters:

- material size?
  coarse, fine, very fine grains
- material acid/base rinsing?
  H_2SO_4 / NaOH (0.4 M)?

Liquid batch

1 L synthetic groundwater
+ 10 g material
+ 0.1 mg As

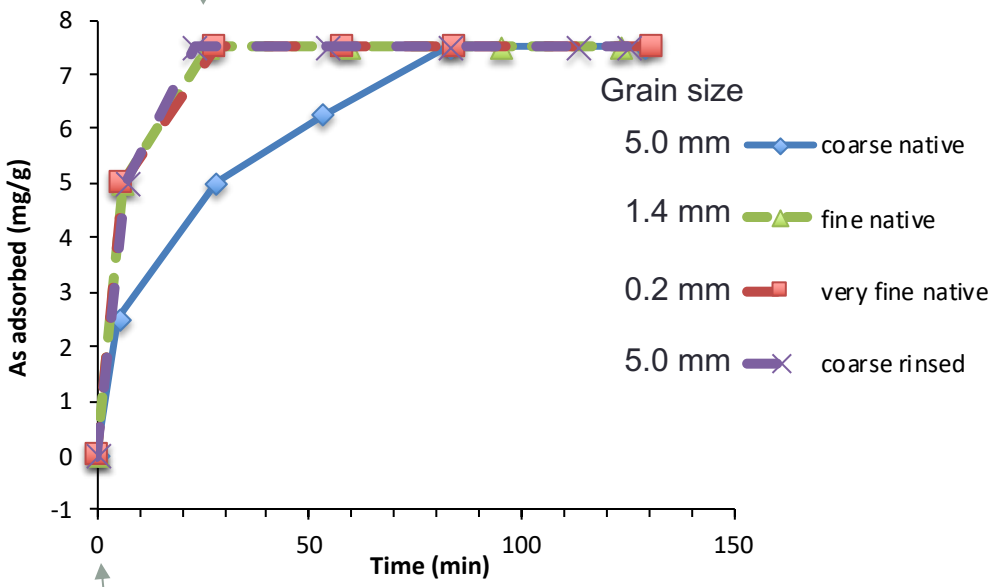


Flow-through

Results

Liquid batch experiments – As removal by banana peels vs. time and material preparation

saturation plateau at 20 min, with 7.5 mg As / g banana peel



Time 0: 10 g banana peel + 0.1 mg As

- Fine vs. coarse:
  slower removal with coarse,
  but similar capacity
- Coarse rinsed vs. native:
  adsorption faster with rinsing,
  balancing size effect
- Fine vs. very fine:
  no effect

Conclusion

- Banana peel appears a promising sorbent material for As removal from groundwater.
- Sorption capacity = 7.5 mg As / g banana peel
- Grinding the material into smaller grain size tends to improve the removal kinetics, but not the capacity.

- Future works: Flow through experiment must find a compromise between the contact time with sorbent material and the flowrate.

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Suite du projet

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Main water source for domestically and factories

west

east

(rural) Cities (rural)

- Projet mis actuellement en veille suite à la crise COVID