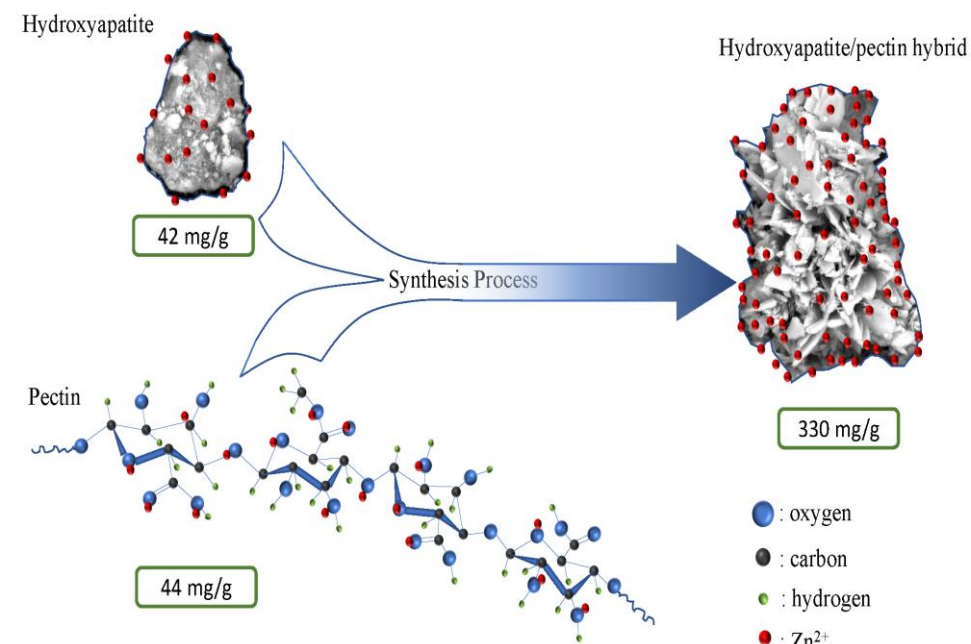


## Abstract:



## Motive:



----Brita water pitcher & filter

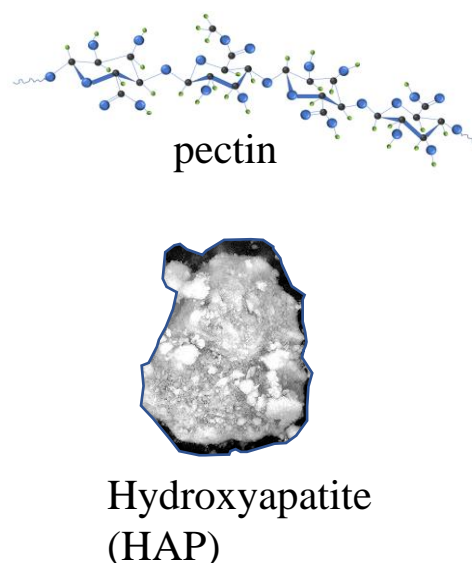
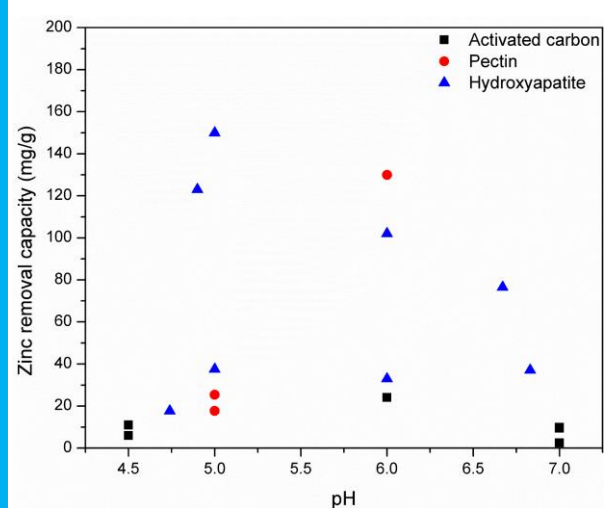
- Normal filters loaded with AC;
- Reduce Cl, Cu, Hg, Cd
- 40 gallons water for each filter
- 2 months for average household usage.

- Filters loaded with new adsorbents
- Double or triple the lifespan

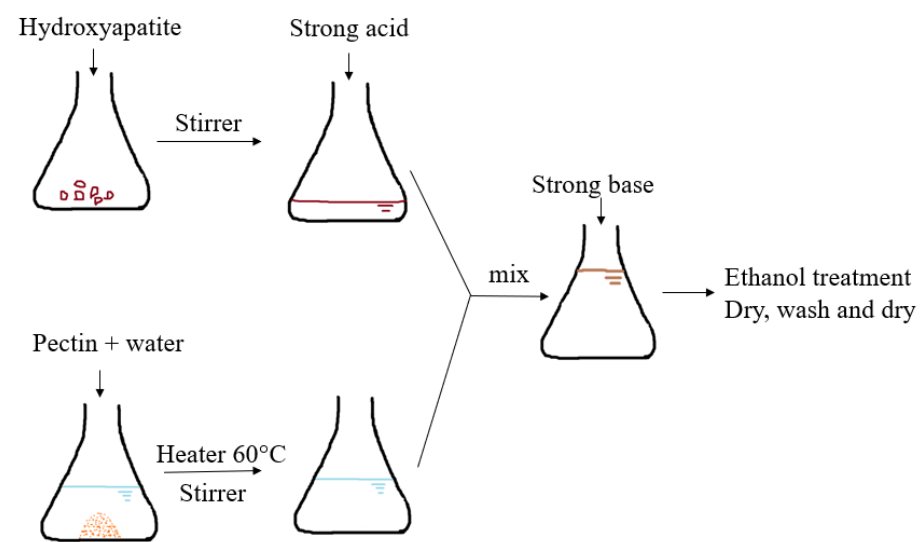
## Requirements of the new adsorbents

- Insoluble in water;
- Non-toxic;
- High affinity toward heavy metals;
- Low cost

Promising candidates:

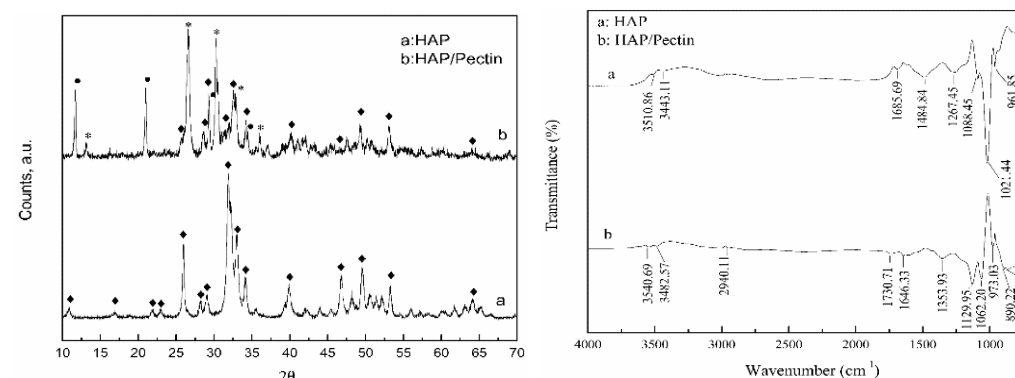


## Methods and Design:



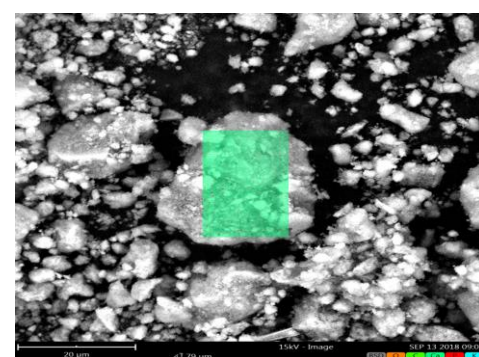
- Use characterization tools to ensure pectin is loaded on the HAP successfully;
- Evaluate of the heavy metal removal performance by using zinc as the target metals;
- Adsorption mechanism study

## Results:

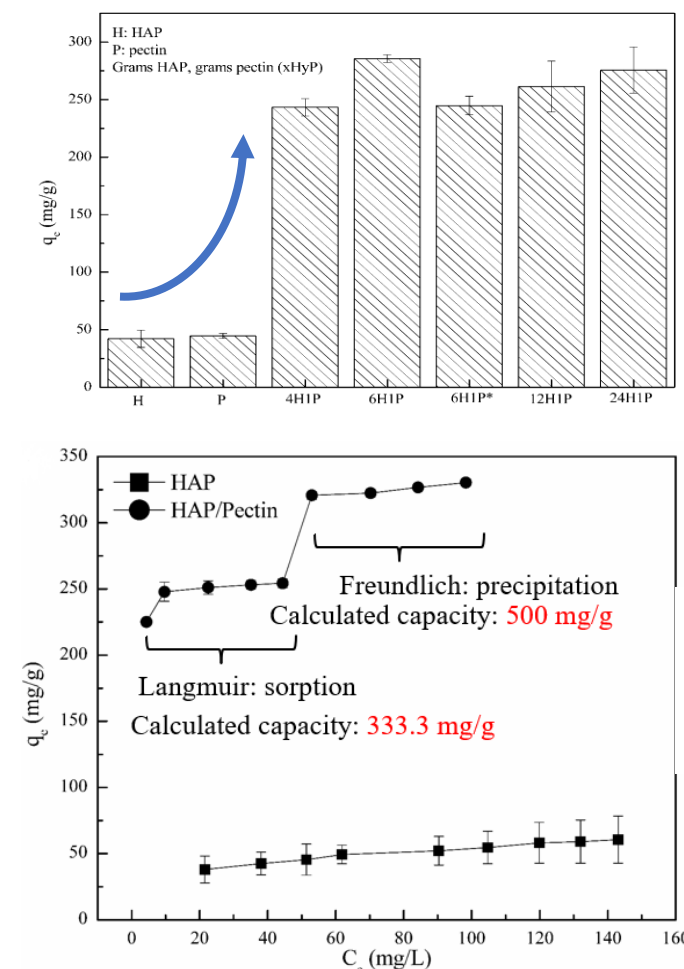
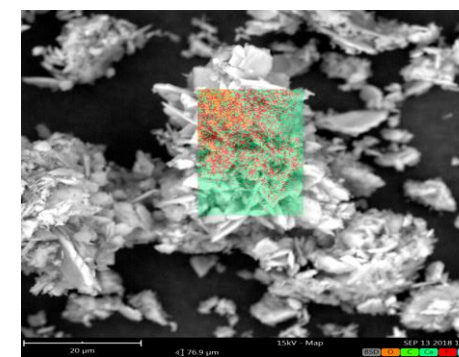


XRD (crystalline phase identification)

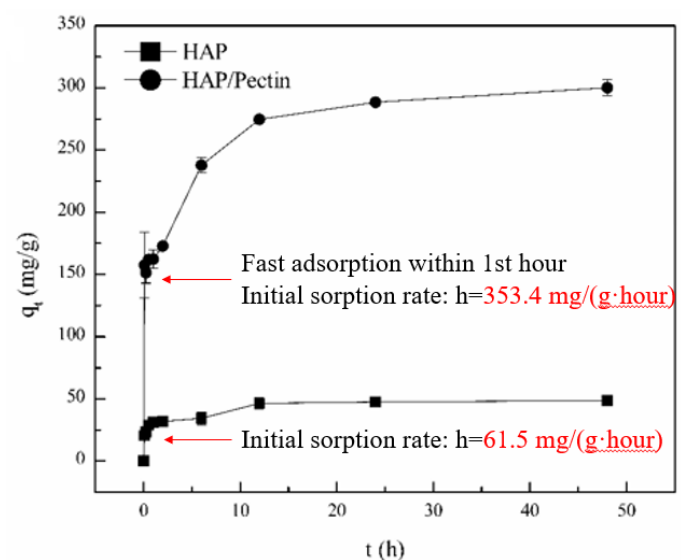
FT-IR (functional group identification)



SEM-EDX analysis of the parental HAP and the synthesized new composite



Max. Experimental capacity:  
330.4 mg/g when 0.5 g/L  
Adsorbents was used to treat  
263 mg/L Zn<sup>2+</sup>



Pseudo 2<sup>nd</sup> order model:

$$\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + \frac{t}{q_e}$$

$$h = k_2 q_e^2$$

## Acknowledgements:

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- SEM-EDX is instructed by Dr. Bruce Idleman

## Reference:

Ni, P.; Fox, J. T., *RSC Advances* **2019**, 9(37), 21095.