Water filter by the Efficiency of Magnetic biochar for Heavy Metal (iron) Adsorption

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INtroduction

INtroduction

PURPOSE

- To study the efficiency of each type of magnetic biochar in adsorption of heavy metals

- To develop magnetic Biochar as a water filter in water purifiers.

PROCESS

Biochar → Type1 of Magnetic Biochar

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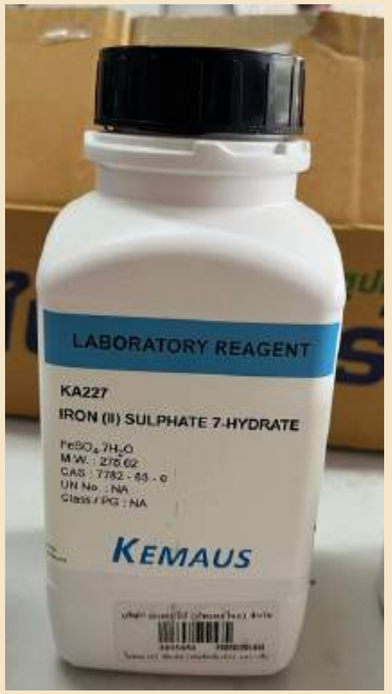

PROCESS

Biochar → Type1 of Magnetic Biochar

Electro-Thermostatic Dying and Air Circulation Oven

PROCESS

Biochar → Type1 of Magnetic Biochar

PROCESS

Biochar → Type2 of Magnetic Biochar

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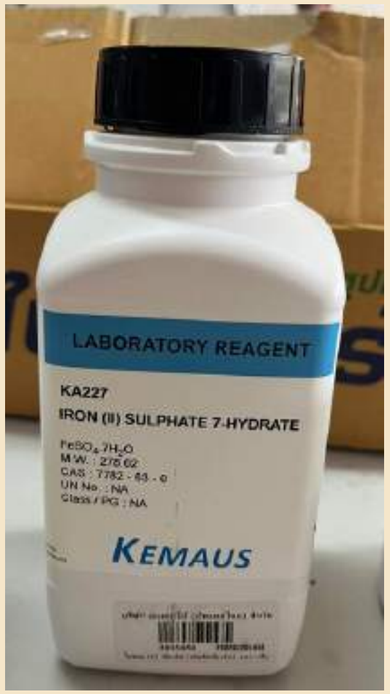


PROCESS

Biochar → Type2 of Magnetic Biochar

Electro-Thermostatic Dying and Air Circulation Oven

PROCESS

Biochar → Type2 of Magnetic Biochar

PROCESS

Synthesis of iron-containing water

PROCESS

Adsorption efficiency test

FeCl3 PAC

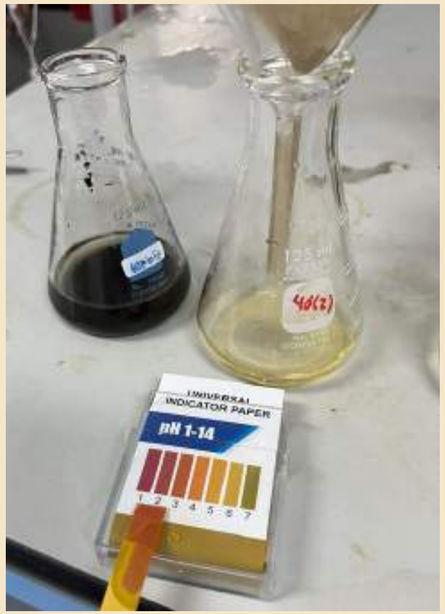
Shaking time: 30 minutes

FeCl3 PAC

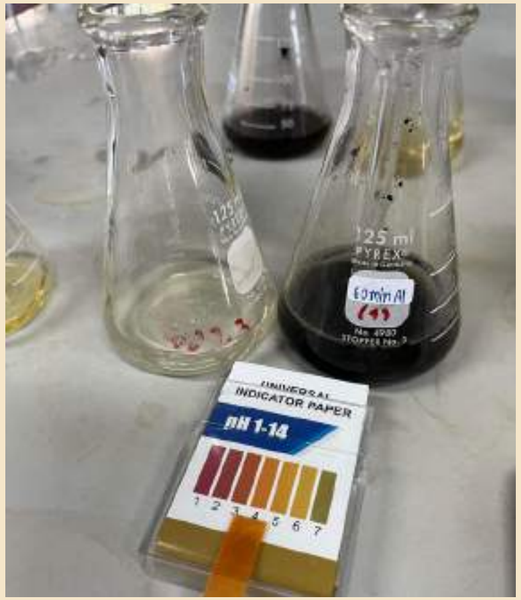
Shaking time: 45 minutes

PROCESS

Adsorption efficiency test



FeCl3



PAC

Shaking time: 60 minutes

PROCESS

Analysis of Adsorption efficiency

ICP-OES

RESULT

Chapter 1.1 Making biochar into magnetic biochar

Magnetic biochar containing FeCl3 is an element.

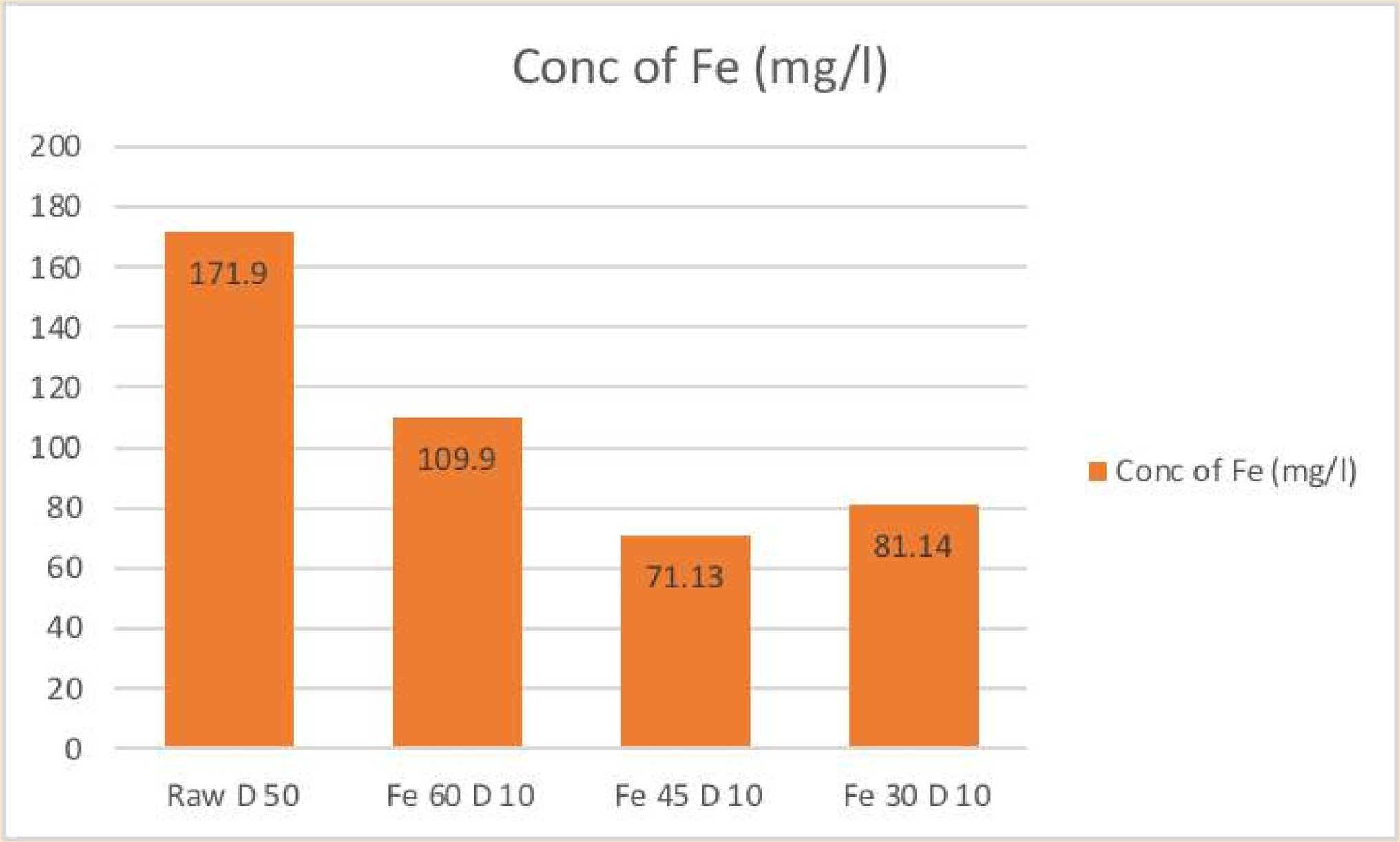
Magnetic biochar containing AlCl3 is an element.

RESULT

Chapter 1.2 Efficiency study of each type of magnetic biochar in adsorption of heavy metals (iron).

No	Sample name	Conc of Fe (mg/l)				
		Rep 1	Rep 2	Rep 3	AVG	%RSD
1	Raw D 50	171.0	174.5	170.3	171.9	1.06
2	Fe 30 D 10	80.8	81.3	81.3	81.1	0.27
3	Fe 45 D 10	70.7	70.1	72.5	71.1	1.44
4	Fe 60 D 10	112.4	108.5	108.8	109.9	1.61

The table shows the results of the analysis of iron content in synthetic iron aqueous solutions using magnetic biochar containing FeCl3 is the adsorption element.

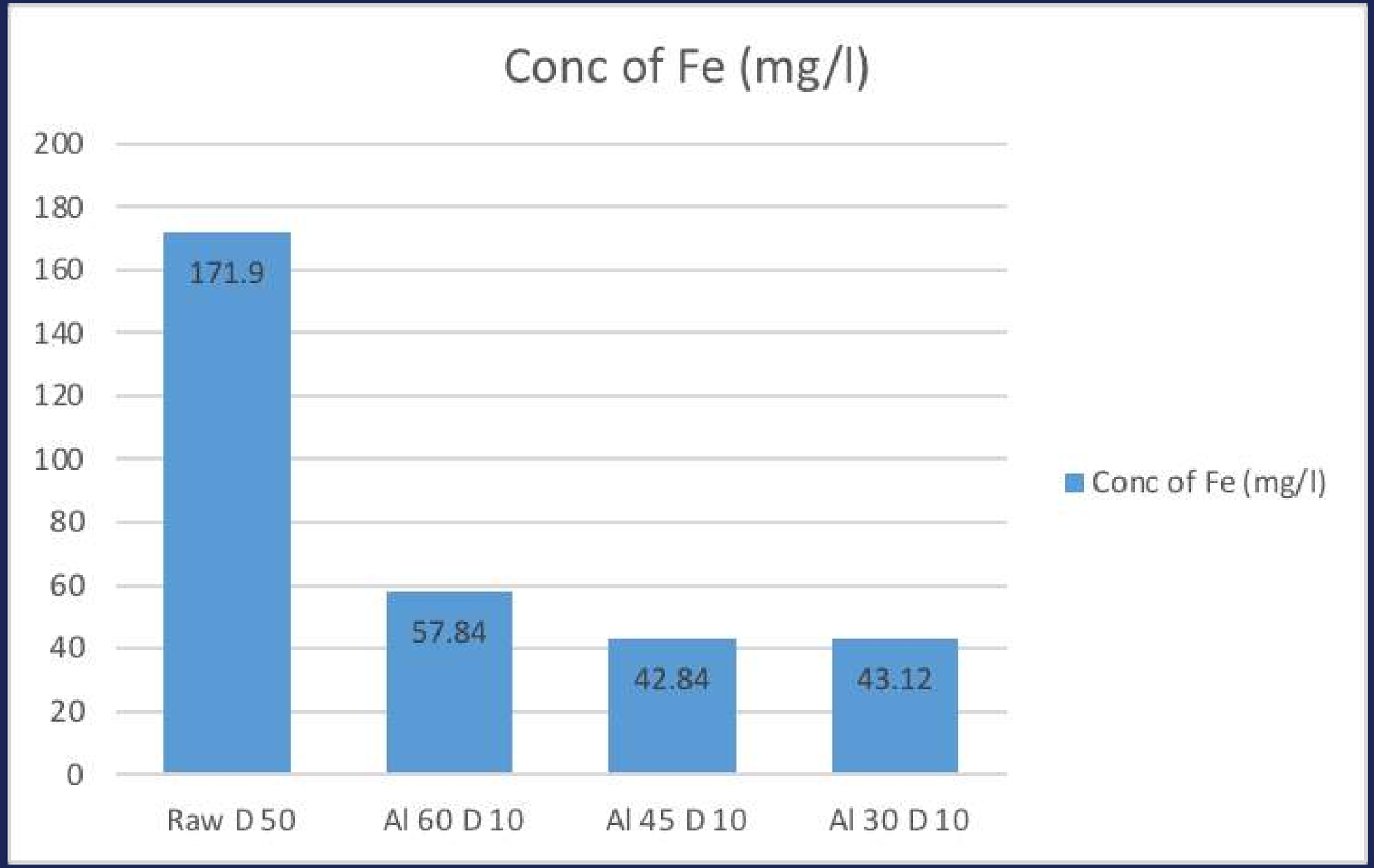

Conc of Fe (mg/l)
200
180
160
140
120
100
80
60
40
20
0
171.9
109.9
71.13
81.14
Raw D 50
Fe 60 D 10
Fe 45 D 10
Fe 30 D 10
Conc of Fe (mg/l)

RESULT

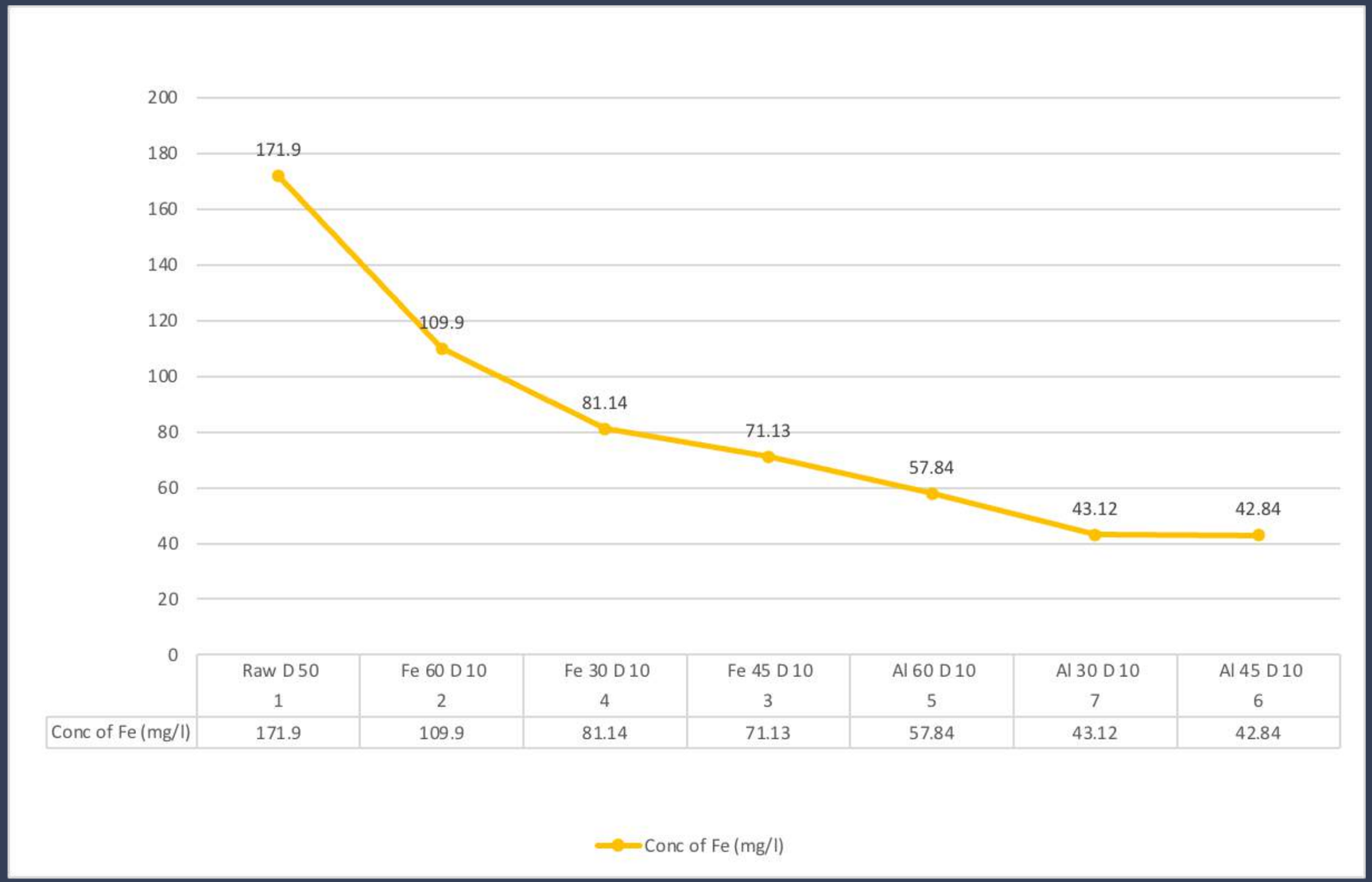
Chapter 1.2 Efficiency study of each type of magnetic biochar in adsorption of heavy metals (iron).

No	Sample name	Conc of Fe (mg/l)				
		Rep 1	Rep 2	Rep 3	AVG	%RSD
1	Raw D 50	171.0	174.5	170.3	171.9	1.06
2	Al 30 D 10	43.8	42.1	43.5	43.1	1.73
3	Al 45 D 10	43.1	43.0	42.5	42.8	0.57
4	Al 60 D 10	57.5	58.5	57.5	57.8	0.85

The table shows the results of the analysis of the iron content in magnetic biochar synthetic iron aqueous solution containing AlCl3 is the adsorption element.


Conc of Fe (mg/l)
200
180
160
140
120
100
80
60
40
20
0
171.9
57.84
42.84
43.12
Raw D 50
Al 60 D 10
Al 45 D 10
Al 30 D 10
Conc of Fe (mg/l)

RESULT



	Raw D 50	Fe 60 D 10	Fe 30 D 10	Fe 45 D 10	Al 60 D 10	Al 30 D 10	Al 45 D 10
	1	2	4	3	5	7	6
Conc of Fe (mg/l)	171.9	109.9	81.14	71.13	57.84	43.12	42.84

Part 2 Comparison of the ability to adsorb heavy metals (iron) in the water of each magnetic biochar

CONCLUSION

FINAL TARGET

We will improve magnetic biochar to be filters that are qualified to adsorb iron from contaminated water.

CONCLUSION

Summary and discussion of experimental results

Biochar that can absorb heavy metals (iron) the best is magnetic biochar containing polyaluminum chloride. Using a shaking time of 45 minutes, it can absorb up to 75.1% of iron from water.

MAGNETIC BIOCHAR

THANK YOU