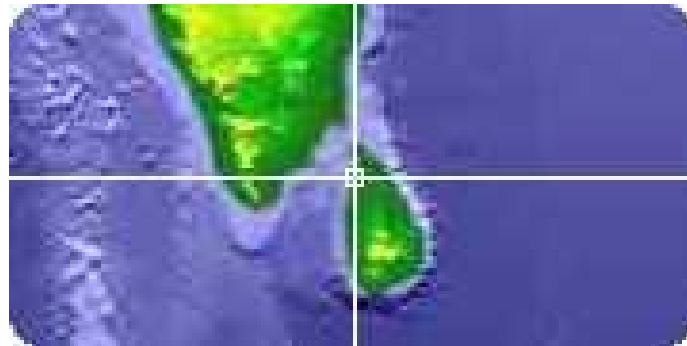


# Determination of inter-layer and structural iron content in Murunkan Clay

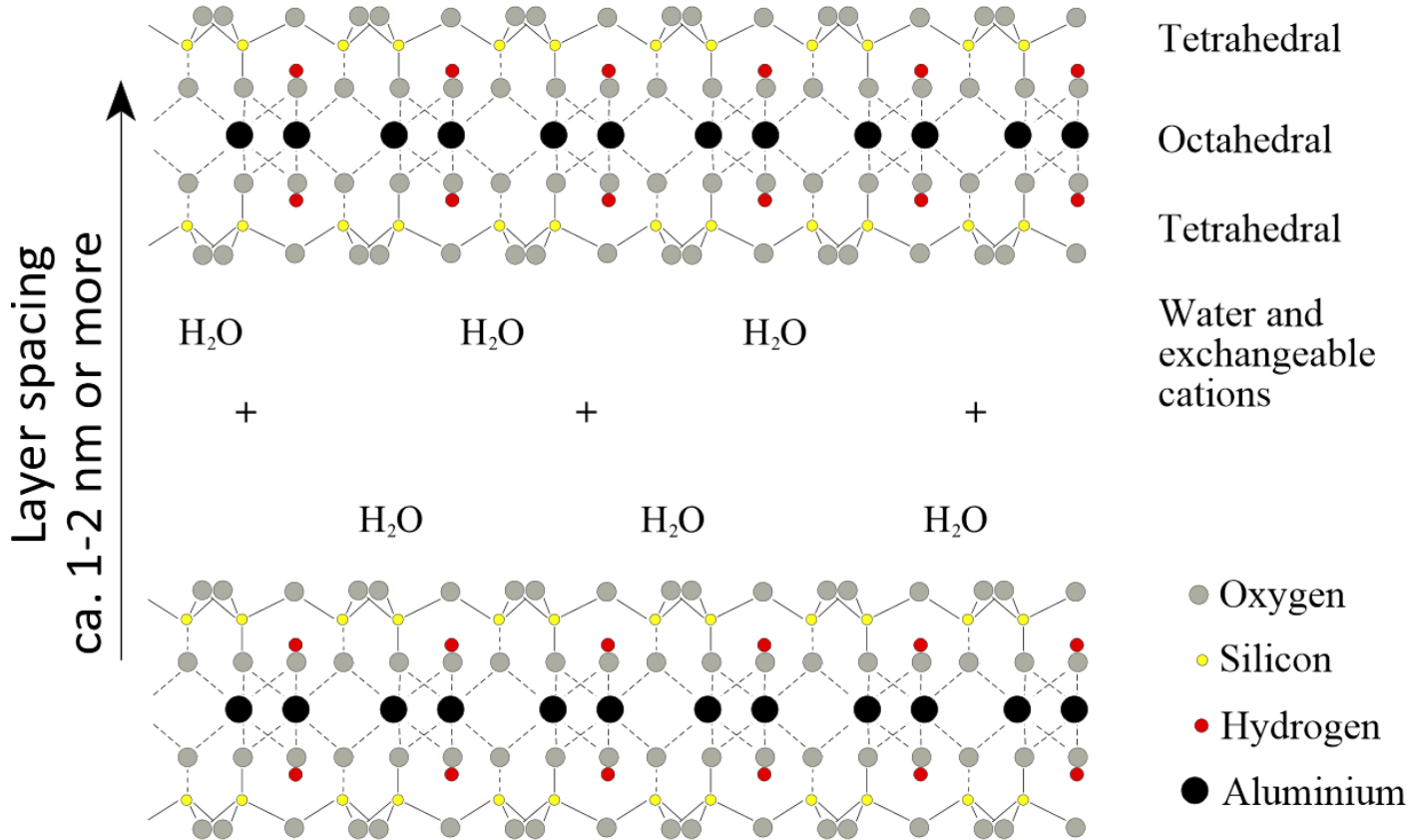
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# Introduction

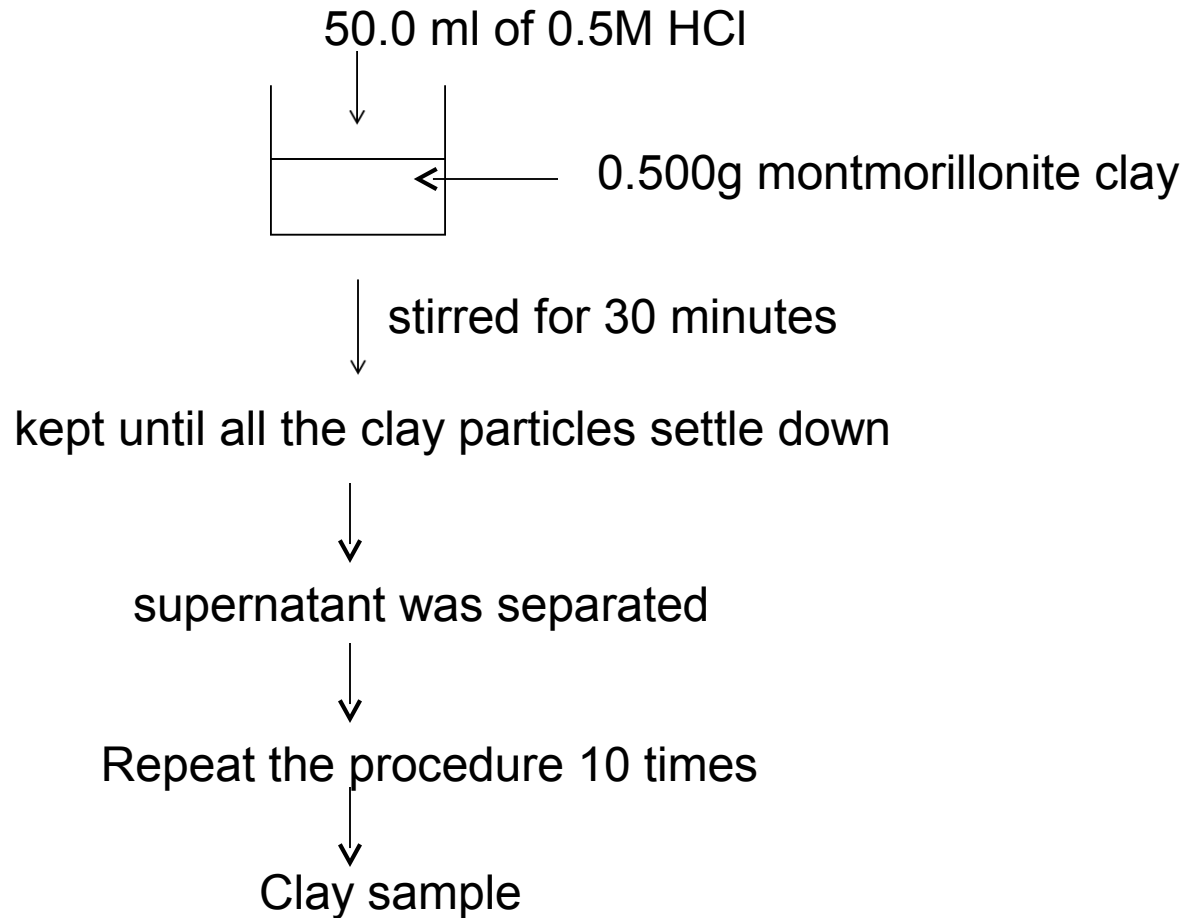
Montmorillonite (MMT) and bentonite belongs to the general family of 2:1 layered silicates



Cont.....

- The smectite content of bentonite and montmorillonites can be improved
  - removing the associated gangue compounds
    - sand, gravel, quartz, feldspars
    - calcite, iron humic acids
- Isomorphic substitution within the layers generates negative charges
- That are normally counter balanced by cations residing in the inter-layer space
- These ions can be stayed in two places in the clay. (a) In between the layers. (b) In the structure of the clay

# Experimental



Cont.....



HCl treated clay sample



Digested completely

Digested clay sample

The elemental analysis was carried out using Atomic absorption spectroscopy.

# Results and Discussion

This XRD pattern proves that the structure of the clay was not damaged during the HCl treatment

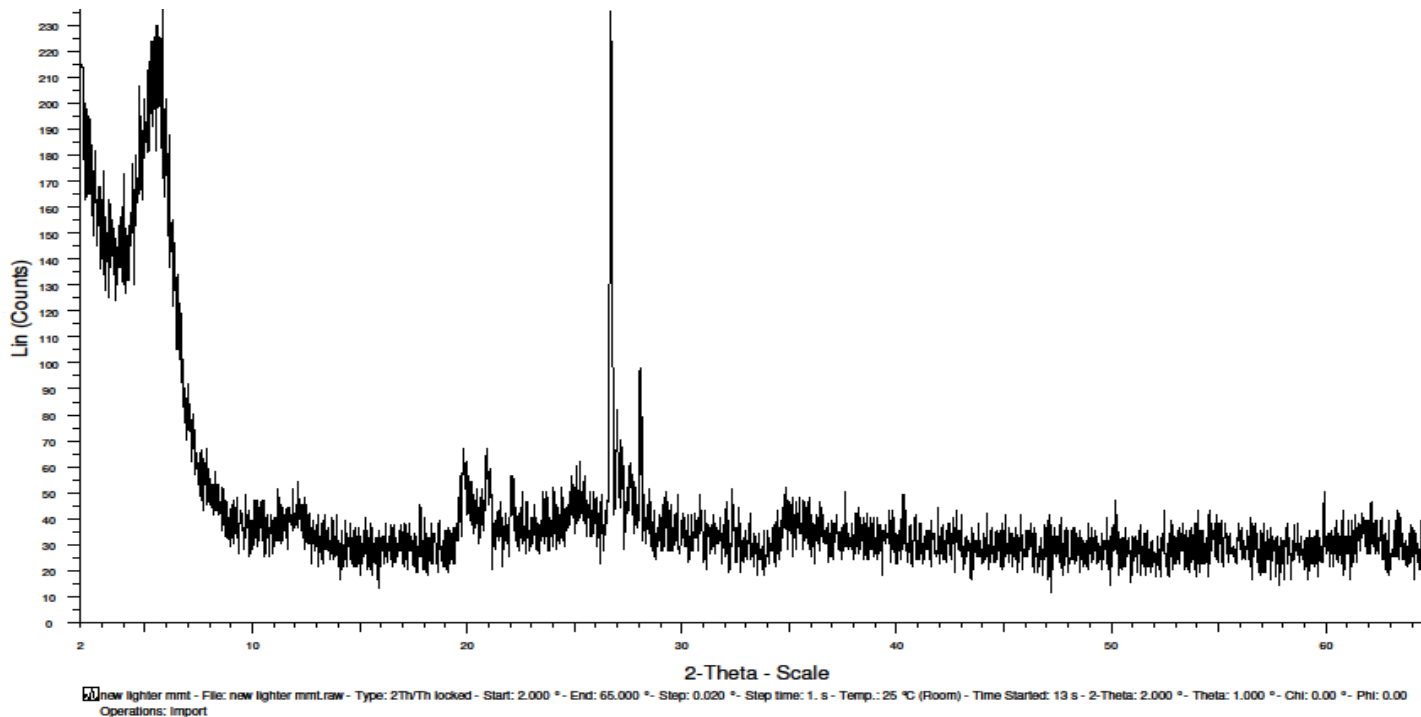


Figure 1: XRD pattern of the clay sample after the acid treatment

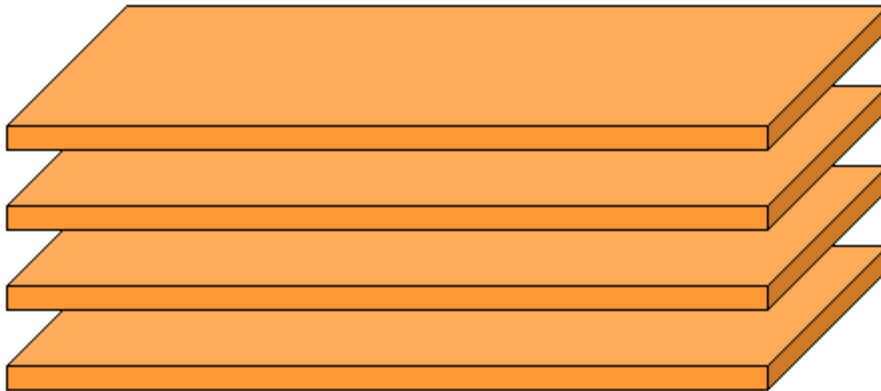
The supernatant of the HCl treated clay samples were studied using AAS to determine the inter-layer iron content

Extraction	Iron concentration in the supernatant (mg/g)
1 <sup>st</sup> extraction	7.08
2 <sup>nd</sup> extraction	7.05
3 <sup>rd</sup> extraction	7.00
4 <sup>th</sup> extraction	6.83
5 <sup>th</sup> extraction	6.31
6 <sup>th</sup> extraction	4.24
7 <sup>th</sup> extraction	3.20
8 <sup>th</sup> extraction	2.28
9 <sup>th</sup> extraction	2.13
10 <sup>th</sup> extraction	1.08

*Table 1: Atomic Absorption Spectroscopy data of supernatants of HCl treated clay*

From the batch extraction process interlayer iron concentration of montmorillonite clay was determined

After the batch extraction process clay sample was completely digested and structural iron concentration was determined



# Conclusions

Interlayer iron concentration of montmorillonite = 47.20mg/g

structural iron concentration of montmorillonite = 21.60 mg/g.



# References:

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