ADSORPTION POWER OF THE CHARCOAL

Team 14

BACKGROUND

According to previous study, due to the Great East Japan Earthquake, the percentage of radioactive materials in our school has increased.

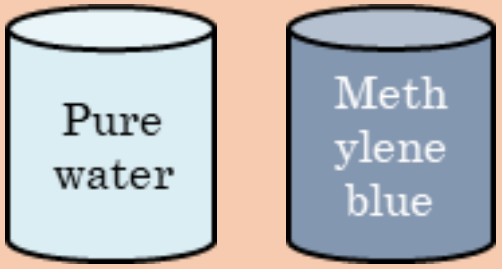
First, We tried to study how to remove radioactive material, but it`s not allowed for school studies.

Therefore, researchers are attracting attention in the removal of radioactive materials. It was decided to conduct research on charcoal`s adsorption ability.

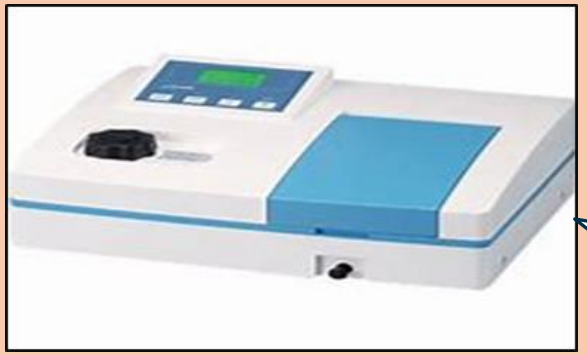
EXPERIMENT

Experiment 1
Checking adsorption power of the charcoal

1. Using methylene blue solution
（5.2×10＾-5） mol/L.
2. Put bincho charcoal, activated charcoal, and walnut`s charcoal into the solution.
3. Mix it for 10 minutes, and leave it as it is for 30 minutes.
4.Using under picture`s spectrophotometer and researching numeric change.



Abs: 0.00 2.077



A spectrometer measures the amount of light passing through a solution sample when light is added to it, and analyzes the amount of light that the sample absorbs.

Experiment 2
Observing the charcoal using an electron microscope

Viewpoint

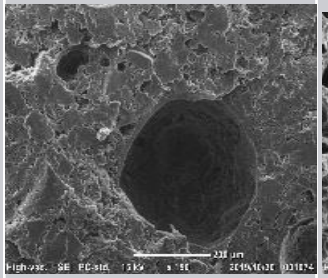
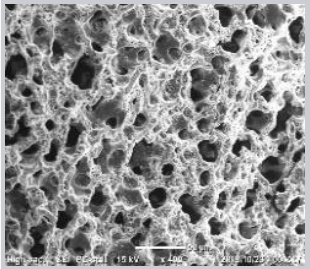
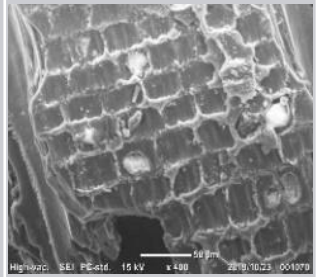
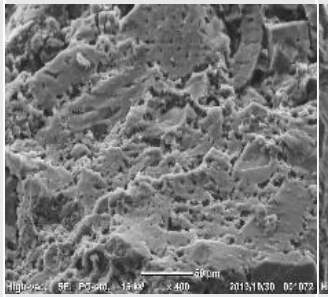
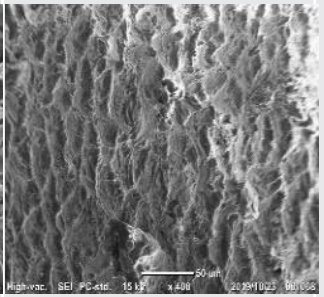
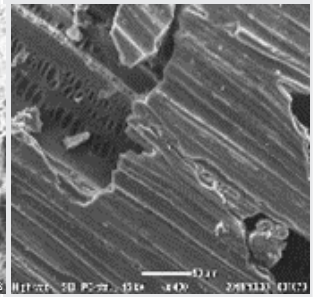
1.Difference in structure of every charcoal.
2.Change of the state before and after the adsorption.

RESULT

Table 1 Absorbance of methylene solution after 40 minutes(arb.Units)

	Pure water	Before	Active carbon	Walnut	BBQ carbon
First	0.000	2.098	0.142	1.046	1.324
Second	0.000	2.061	0.035	1.031	1.126
Third	0.000	2.073	0.059	1.035	1.178
Average	0.000	2.077	0.079	1.037	1.209
Percentage			96.2%	50.0%	41.8%
Picture					

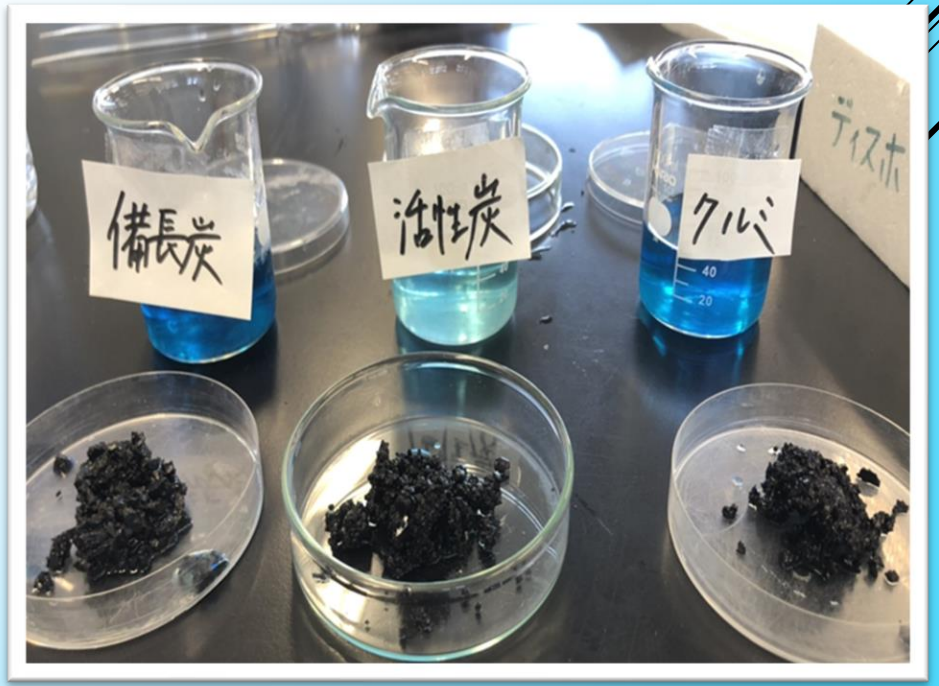
Table 2 Density of blue solution charcoal

	Active carbon ×100	Walnut ×400	BBQ carbon ×400
Before			
After			

(*absorbance: compared to pure water.)

CONCLUSION

From the table active carbon adsorbed more pigment than other charcoal.
Active carbon is 20,000 to 60,000 times larger in size than ordinary charcoal.
So it turned out holes become larger when charcoal is carbonized.
And this increases the adsorption power.



FUTURE WORK

Use other carbon → Is there any charcoal which is better than active charcoal in adsorption power?

Reuse of the charcoal → Can you reuse the charcoal after having used it, how long can it adsorb it at the maximum?

REFERENCES

平成25年課題研究　三高周辺の放射線測定
水がキレイになるヒミツは？　ジェックス株式会社　http://www.p-crystal.jp/carbon.html
トウモロコシの芯から炭を作り水の浄化に役立つ吸着作用を調べよう　長崎大学工学部
https://www.mirai-kougaku.jp/laboratory/pages/180323.php