

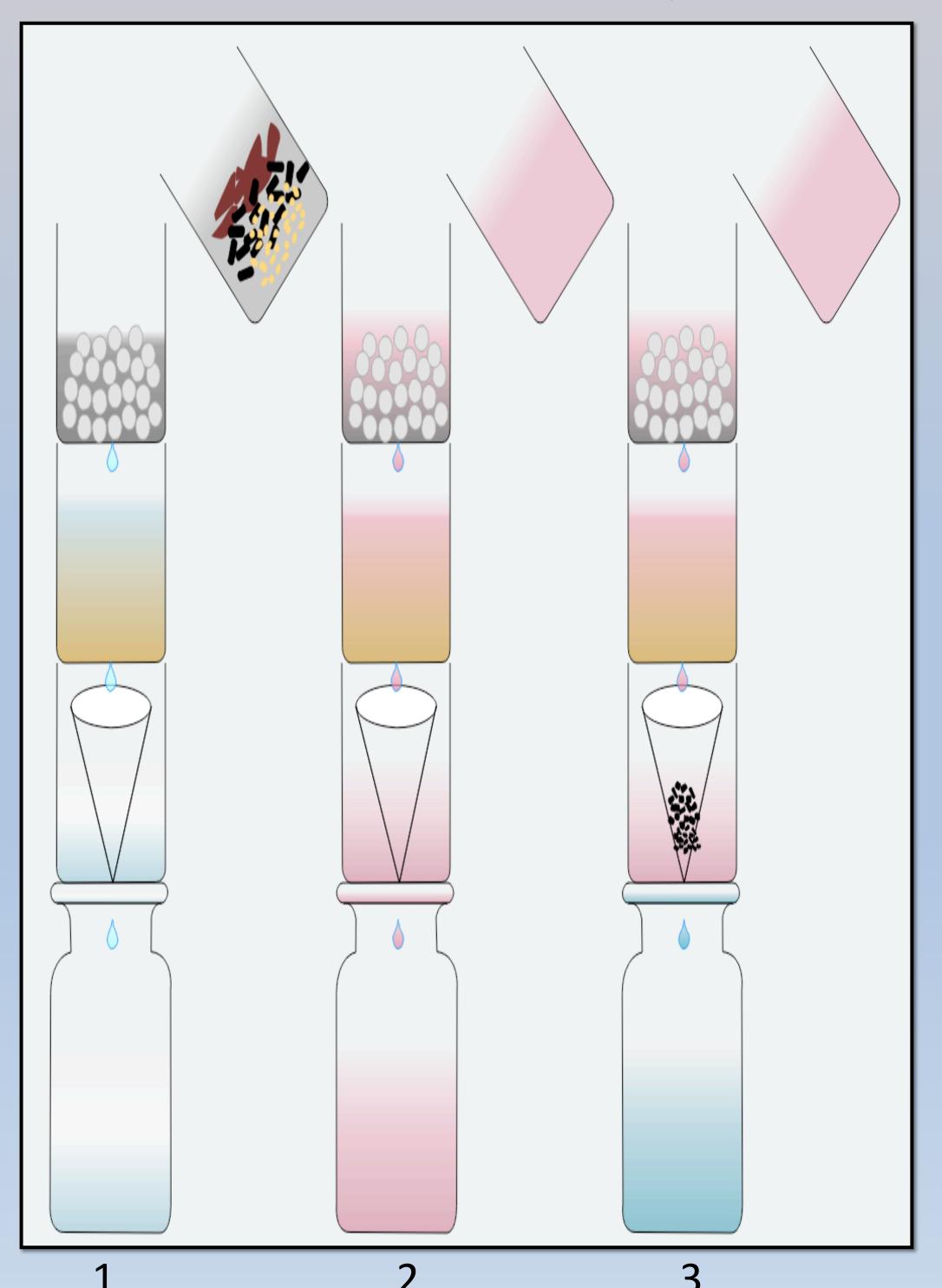
Investigation of Activated Carbon Filtering Distillation System Alvin Ng and Dr. Birce Dikici (Advisor) Mechanical Engineering Department, Embry-Riddle Aeronautical University

OBJECTIVE:

Activated carbon is often used in water filtration systems. The purpose of this research is to determine the effectiveness of activated carbon and the factors that affect the performance.

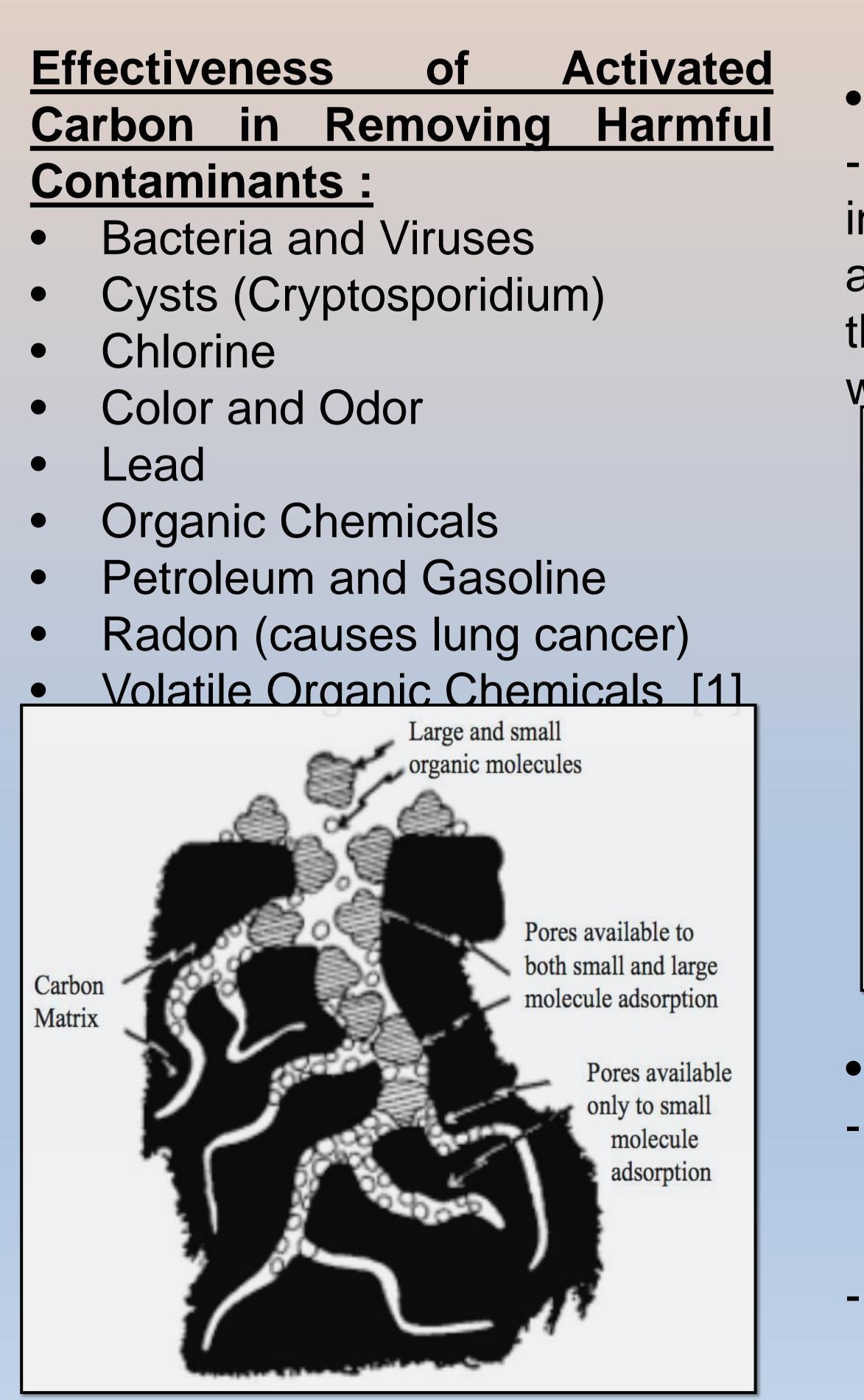
INTRODUCTION:

Activated carbon removes organic chemically constituents by adsorbing contaminants through its pores. It also improves the taste minimizes health hazards and found in water supplies such as chlorine, lead and radon which are metals and radioactive substance harmful to the human body.



Experiments:

Experime nt	Layers	Sample	Observation
1	Pebbles, sand and filter paper	Dirty Water	Clear water
2	Pebbles, sand and filter paper	Colored water	Colored Water
3	Pebbles, sand, filter paper , and activated carbon	Colored water	Clear water



Adsorptive process where contaminants are filtered and withheld in the pores

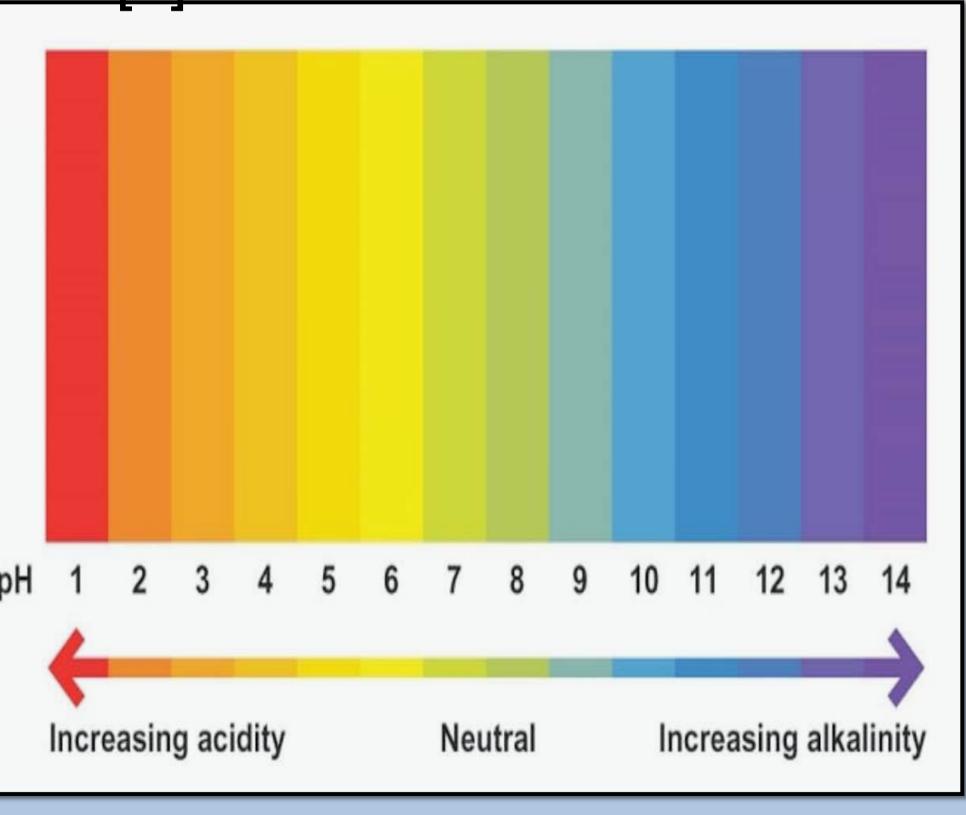
Factors that Affect the Performance of Activated Carbon:



Powdered activated carbon

• Molecular Weight

weight the molecular As the activated carbon increases, adsorbs more effectively because the molecules are less soluble in water [2].



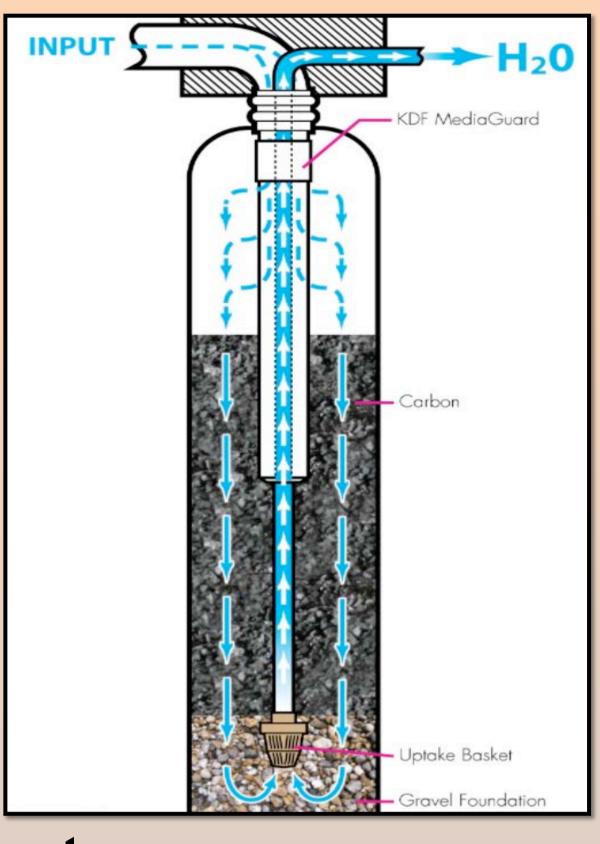
pH value

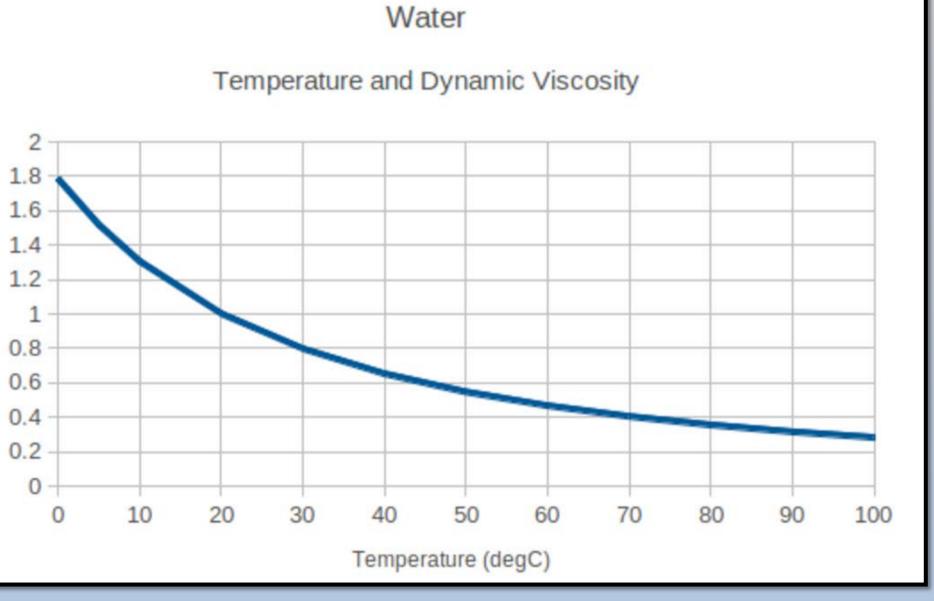
- At lower pH values, organics are less soluble and will be easily adsorbed by activated carbon. - The size of carbon is increased by 20% for every pH unit above neutral pH (7.0) to increase adsorption [2].

• Flow rate - The the flow lower rate, contaminants have more time to diffuse into pores and be adsorbed. At high flow rates using finer mesh filtering will cause an carbon increased pressure drop.

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viscosity (µ) decreases. This can increase the diffusion rate. However, higher temperatures can disrupt the adsorptive bond and decrease adsorption. Therefore, it depends the organic compound being removed [2]. **REFERENCES:**





Temperature

temperature increases, the

[1] Lemley, Ann, Linda Wagenet, and Barbera Kneen. "Activated Carbon Treatment of Drinking Water." Activated Carbon. Cornell University Cooperative Extension, 3 Dec. 1995. Web. 1 Apr. 2017.

[2] DeSilva, Frank. "Activated Carbon Filtration." Activated Carbon Filtration. Water Quality Products Magazine, Jan. 2000. Web. 1 Apr. 2017.