Preview Assessment: Adsorption

Name	Adsorption
Instructions	
Multiple Attempts	This Test allows multiple attempts.
Force Completion	This Test can be saved and resumed later.

Question Completion Status:

Question 1 **10 points** Save

Dissolved organic compounds are removed by:

- ☐ Rapid sand filtration
- ☐ Dual media filtration
- ☐ Granular activated carbon filtration
- ☐ Powdered activated carbon
- ☐ Continuous filtration
- ☐ Pseudo moving bed filtration

Question 2 **10 points** Save

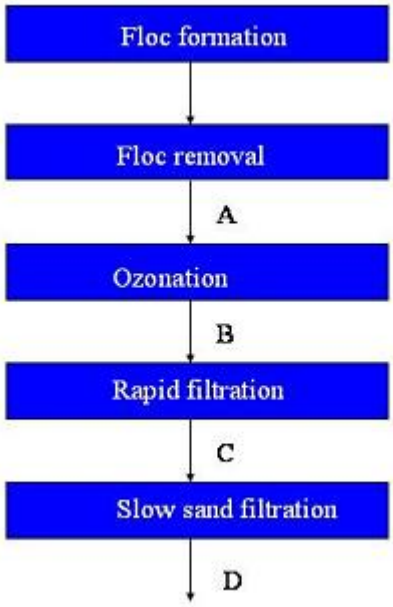
Activated carbon is mainly used for the treatment of:

(More answers can be right).

- ☐ Surface water
- ☐ Ground water
- ☐ River bank groundwater
- ☐ Infiltration water

Question 3 **10 points** Save

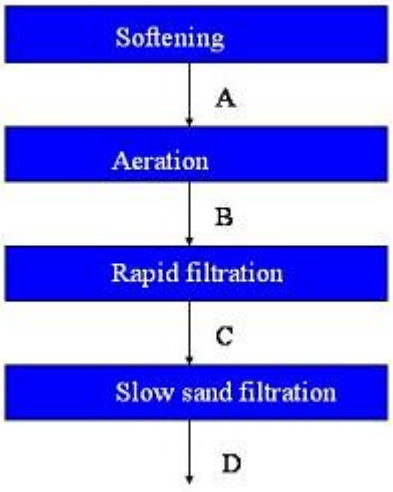
Indicate the position of Granular Activated Carbon filtration in a treatment train



- A
- B
- C
- D

Question 4 **10 points** Save

Indicate the position of Powdered Activated Carbon in a treatment train



- A
- B
- C
- D

Question 5 **10 points** Save

True or False:

Trihalomethanes are toxic.

- True
- False

Question 6 **10 points** Save

When the filter is clogged with suspended matter or biomass and the resistance is high, the granular activated carbon filter bed is:

- Regenerated.
- Back washed.
- Scraped
- Uploaded

Question 7 **10 points** Save

When the activated carbon is saturated with adsorbed organic matter the activated carbon is:

- Regenerated.
- Back washed.
- Scraped
- Uploaded

Question 8 **10 points** Save

What is the order of the regeneration frequency?

- Hours
- Days
- Months
- Years

Question 9 **10 points** Save

True or False?

The higher the concentration adsorbable matter in the bulk liquid, the smaller the loading capacity.

- True
- False

Question 10 **10 points** Save

The relation between contact time and filter run time depends on the adsorption characteristics of the compound to be removed.

True or False:

In general the filter run time increases exponentially with decreasing contact time.

- True
- False

Question 11 **10 points** Save

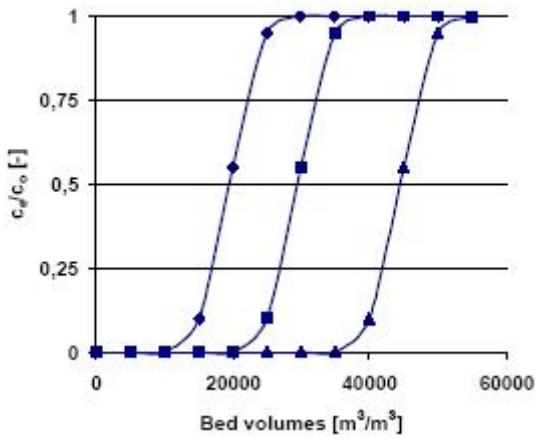
Assume a Granular activated carbon filter that treats a flow of 500 m^3/h and has a surface area of 50 m^2 and a bed heigth of 3 m.

Determine the EBCT and the number of BV after a year of operation.

- EBCT = 18 min. and BV = 29200
- EBCT = 20 min. and BV = 1217
- EBCT = 20 min. and BV = 29200
- EBCT = 18 min. and BV = 1217

Question 12 **10 points** Save

In the figure 3 breakthrough curves are shown. One is for THM, one for Bentazon and one for taste. Which line belongs to which organic compound?



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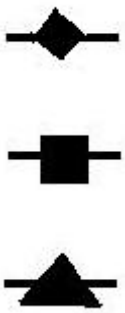


A. Bentazon
B. THM
C. Taste

Question 13 **10 points** Save

Assume a Granular Activated Carbon filter that has a run time of 29200 BV and is filled with 150 m^3 activated carbon with a density of 400 kg/m^3

What is the atrazin loading capacity of the carbon, assuming an influent concentration of 2.10^-3 mg/l and a steep (ideal) breakthrough curve.

- 58.4 g/kg
- 0.146 g/kg
- 8.76 g/kg
- 0.876 g/kg

Question 14 **10 points** Save

Assume a Granular Activated carbon filter with the following characteristics:

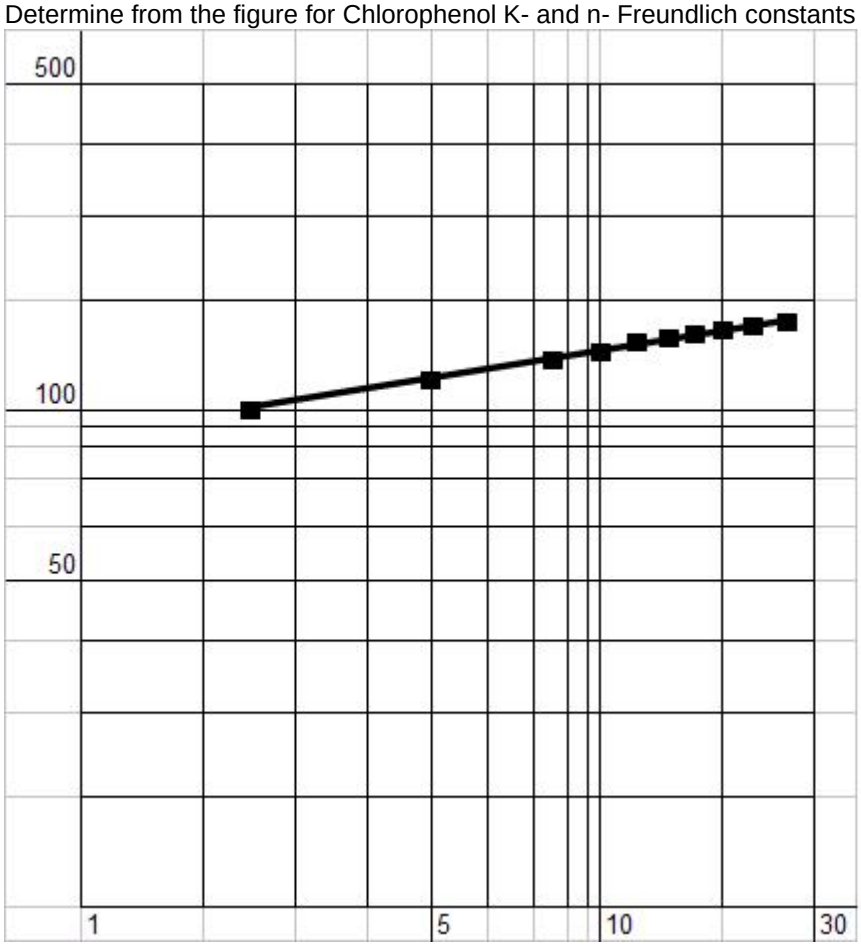
qmax = 0.25 g/kg; c0 = 0,004 mg/l; EBCT = 12 min; k2 = 20/h; rho = 400 kg/m^3;

Determine the effluent concentration after 20000 BV

- 3.23*10^-3 mg/l
- 3.1*10^-3 mg/l
- 4*10^-3 mg/l
- 1.24*10^-3 mg/l

Question 15 **10**

Determine from the figure for Chlorophenol K- and n- Freundlich constants



- K=85 n=0.18

- K=85 n=0.10
- K=130 n=0.20
- K=130 n=0.10

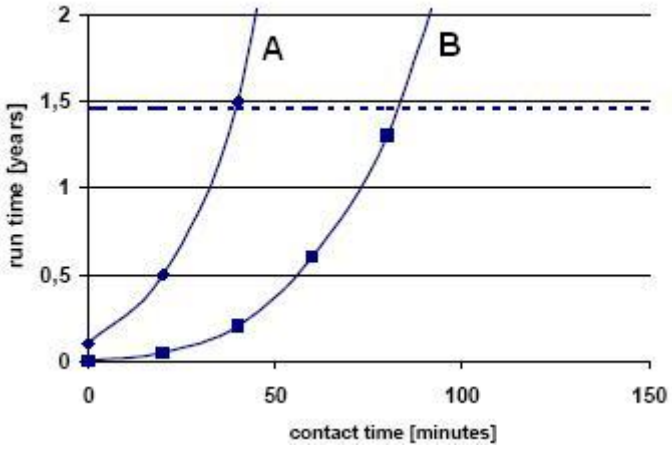
Question 16 **10 points** Save

Two filters are placed in series at the "pseudo-moving-bed" system. The cleanest filter is:

- The first filter
- The second filter
- Sometimes the first filter, sometimes the second filter.

Question 17 **10 points** Save

In the figure is the influence of pre-ozonation on required contact time shown for biological activated carbon filtration. Which line shows the influence of pre-oxidising the organic matter by ozon?



- A with ozon, B without ozon
- B with ozon, A without ozon

Question 18 **10 points** Save

Tue or False:

The organic matter that is adsorbed in winter will partially be decomposed biologically in summer.

- True
- False

Question 19 **10**

Calculate for the dosing of powdered activated carbon the minimal dose in mg/m^3.

A water company is fasing a concentration of 0.5 µg/l atrazine in the surface water. With activated carbon the water comapny wants to reduce the concentration below the legislated concentration of 0.1 µg/l. Two option are evaluated:

a. dosing of powdered activated carbon before the coagulation

b. Granular Activated Carbon filtration after the rapid sand filters. GAC-filters should be build.

The Freundlich constants for atrazine are:

K	=	20	**$(g/kg)(m^3/g)^n$**
n	=	0.77	-
ρ	=	400	kg/m^3

- 0.017
- 0.057
- 24
- 7

Question 20 **10 points** Save

Calculate for the Granular Activated Carbon filtration the minimal dose in g/m^3.

- 0.017
- 0.057
- 1.7
- 8.7

Question 21

Which of the two pesticides is the most difficult to remove, regarding both the concentration as well as the affir for the activated carbon.

The raw water of a surface water treatment plant contains 1.4 µg/l atrazin and 0.8 µg/l diuron. The Freundlich-constants for diuron and atrazin are given in the table below.

Pesticide	K [(g/kg)·(m^3/g)]	n [-]
Diuron	10	0.50
Atrazin	30	0.50

The regulated maximum concentration in the drinking water is 0.1 µg/l.

- Diuron
- Atrazin

Question 22 **10 points** Save

For two ideal mixers placed in series the loading capacity of the powdered carbon in the second tank is .... than in the first tank.

- higher

lower

Save Submit