Comparing Selective Membranes in a Model Wash

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom model uses a membrane to wash dissolved salt out of a solution containing a large colored polymer. It measures the percentage of each solute that crosses into fresh water. A membrane is acceptable if at least 80% of the salt crosses and at most 5% of the polymer crosses during the test.

Membrane	**Salt crossing (%)**	**Polymer crossing (%)**
A	91	12
B	85	3
C	65	1

1 Which membrane meets both requirements?

(1) A only

(2) B only

(3) C only

(4) B and C

2 Give a particle-size explanation for why a membrane could pass many dissolved ions but little of the polymer. [1]

Answer and work

A student tests a used piece of B and finds 75% salt crossing and 2% polymer crossing. The class wants to know whether use caused the change or whether this piece of B already performed differently when new.

3 Describe a comparison that would better isolate the effect of repeated use on B. State what to measure. [1]

Answer and work

4 A student says the used piece still meets the requirements because it loses less polymer. Evaluate that claim using both limits. [1]

Answer and work