Counting Chains in a Model Polymer Batch

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

A class models an addition polymer. Joining two monomers into a chain keeps all atoms of both monomers in that chain. The model makes no small-molecule byproduct. Two batches start with 800 identical monomer units each.

Batch	Chains shown after reaction	Monomer units in each shown chain
A	8	100
B	4	200

1 Calculate the number of monomer units in the shown chains for each batch. [1]

Answer and work

2 Which comparison follows from the model?

(1) A has more polymer mass because it contains more chains.

(2) B has more polymer mass because each chain is longer.

(3) Both have the same polymer mass because they contain the same number of identical units.

(4) Both have zero polymer mass because no byproduct formed.

A third batch also starts with 800 units. A record shows six chains of 100 units each and reports that some monomer remains unjoined.

3 Calculate how many unjoined units remain in the third batch under the model. [1]

Answer and work

4 A student compares only the mass of separated polymer and concludes that matter disappeared in the third batch. Explain what measurement is missing. [1]

Answer and work