Counting Recovered Product After a Recycle

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

A process model converts one mole of A to one mole of B. Each pass converts 60% of the A fed to it. The collection step saves 80% of the B that forms. Uncollected B is separated from the unreacted A and cannot enter a later pass. Treat the two fractions as exact model values.

First-pass record	**Value**
A fed into the process	0.100 mol
Fraction of A converted	0.60
Fraction of formed B collected	0.80

1 Calculate how much B forms on the first pass and how much of that B is collected. [1]

Answer and work

2 How much unreacted A leaves the first pass?

(1) 0.012 mol

(2) 0.040 mol

(3) 0.048 mol

(4) 0.060 mol

The model sends all the unreacted A through the same process one more time. No fresh A is added. The fractions converted and collected are unchanged.

3 Calculate how much more B is collected in the second pass and how much is collected over both passes. [1]

Answer and work

4 A student says the two-pass collection amount accounts for every mole of A that reacted. Explain what the calculation omits. [1]

Answer and work