

**Problem Solving****Chapter 6****BLM 6-2****Using the Law of Definite Proportions****Goal**

Practise using the law of definite proportions.

**What To Do**

Study the solution to the sample problem below then use the same approach to solve the practice problems below.

**Sample Problem**

A 137.1 g sample of silver bromide was found to contain 78.8 g of silver.

- (a) How much bromine was in the sample?  
 (b) How much silver would there be in a 500 g sample of this compound?

Here is the data from the problem, set out in a table.

	silver bromide	silver	bromine
sample (a)	137.1 g	78.8 g	$x$ g
sample (b)	500 g	$y$ g	$z$ g

The problem solution requires finding the values of  $x$  and  $y$ . You can also find  $z$ .

- (a) Use conservation of mass to find  $x = 137.1 \text{ g} - 78.8 \text{ g} = 58.3 \text{ g}$ .  
 (b) Since the proportions are the same in the two samples, we can write

$$\frac{137.1 \text{ g}}{500 \text{ g}} = \frac{78.8 \text{ g}}{y}, \text{ which gives } y = 287.4 \text{ g}.$$

Thus, the first sample contained 58.3 g of bromine, and 500 g of silver bromide would contain 287 g of silver.

**Practice Problems**

- A 45.6 g sample of zinc sulfide was found to contain 30.6 g of zinc. Find the masses of zinc and sulfur contained in 250 g of zinc sulfide.
- 39.5 g of cobalt will combine with 107 g of bromine to form a binary compound, A. How much of compound A can be formed from the reaction of 250 g of cobalt with sufficient bromine?
- Analysis of 24.1 g of calcium oxide revealed that it contained 17.2 g of calcium. What mass of this compound would contain 60 g of calcium?