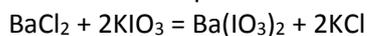**Task:**

What reagent would you predict to be in excess for reacting 6.25 mL of a
0.10 M of barium chloride solution with 6.25 mL of 0.10 M KIO3 solution?

Solution:
The chemical equation for this reaction is
$BaCl_2 + 2KIO_3 = Ba(IO_3)_2 + 2KCl$

According to the equation the number of moles of KIO_3 is twice the number of moles of $BaCl_2$.
$n(KIO_3) = 2 \cdot n(BaCl_2)$
The number of moles of the reactants is
$n \ (mol) = C(M) \cdot V(L)$
$n \ (BaCl_2) = 0.10 \cdot 6.25 \cdot 10^{-3} = 6.25 \cdot 10^{-4} \ mol$
$n \ (KIO_3) = 0.10 \cdot 6.25 \cdot 10^{-3} = 6.25 \cdot 10^{-4} \ mol$

According to the equation the number of moles of $BaCl_2$ has to be

$n \ (BaCl_2) = 6.25 \cdot 10^{-4} / 2 = 3.125 \cdot 10^{-4} \ mol$
That is less than we have in solution, that's why $BaCl_2$ is in excess.

Answer: $BaCl_2$ is in excess