From the following reaction:

\[ \text{K}_2\text{Cr}_2\text{O}_7 + \text{KI} + \text{H}_2\text{SO}_4 \rightarrow \text{Cr}_2(\text{SO}_4)_3 + \text{K}_2\text{SO}_4 + \text{I}_2 + \text{H}_2\text{O} \]

Find: (a) The oxidized and reduced chemical,
(b) The oxidizing and reducing agent,
(c) Balance equation

Notes:
- Oxidation is the loss of electrons.
  An element is called oxidized if it loses electron(s) during chemical reaction.
- Reduction is the gain of electrons.
  An element is called reduced if it gains electron(s) during chemical reaction.
- Check each element to see if their charge was changed after chemical reaction.

Solution:

Potassium \( \text{K} \) ion is an alkali metal with always +1 charge. \text{No change}.

Oxygen \( \text{O} \) is nonmetal with always -2 charge in compound. \text{No change}.

Hydrogen \( \text{H} \) is nonmetal with always +1 charge in compound. \text{No change}.

\( \text{SO}_4 \) is a polyatomic ion with always -2 charge. \text{No change}.

Chromium \( \text{Cr} \) is a transition metal with multiple positive charge: in \( \text{K}_2\text{Cr}_2\text{O}_7 \) (the reactant)

\( \text{Cr} \) is +6 charge but in \( \text{Cr}_2(\text{SO}_4)_3 \) (the product) \( \text{Cr} \) is +3 charge, so that means \( \text{Cr: from +6 to +3, so gains 3 electrons.} \)

Iodine \( \text{I} \) is a nonmetal with always -1 charge in compound but after chemical reaction iodine becomes single element iodine with zero charge, so \text{it loses one charge}. 

(a) Chromium is reduced. Iodine is oxidized,
(b) Chromium is the oxidizing agent. Iodine is the reducing agent.
(c) To balancing the reaction equation:

We start balancing the charge for Chromium and Iodine using the result of (a) and (b):

Because Chromium gains 3 electrons/atom, so total gain 6 electrons for 2 Chromium ($K_2Cr_2O_7$).

Iodine loses 1 electron/atom, so it needs 6 iodine this is follow the conservation rule of charge
during the chemical reaction process as the result we multiply 6 for reactant KI in equation. In order
to balance all the reactants and products in mass we multiply I$_2$ by 3, multiply $K_2SO_4$ by 4, multiply
H$_2$SO$_4$ by 7, and multiply H$_2$O by 7.

Here is the balanced equation:

$$K_2Cr_2O_7 + 6KI + 7H_2SO_4 \rightarrow Cr_2(SO_4)_3 + 4K_2SO_4 + 3I_2 + 7H_2O$$