A pressione costante, il volume di una data massa di gas varia linearmente al variare della temperatura (legge isobara di Charles):

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$V_2\ HCl = \frac{1{,}00\ dm^3 \cdot 673\ K}{273\ K} = 2{,}47\ dm^3$$

$$V_2\ O_2 = \frac{2{,}00\ dm^3 \cdot 673\ K}{273\ K} = 4{,}93\ dm^3$$

	$4\ HCl$	$+\ O_2$	$\rightleftharpoons$	$2\ H_2O$	$+\ 2\ Cl_2$
V_i	2,47	4,93		0	0
Δ	$-4x$	$-x$		$+2x$	$+2x$
V_f	$2{,}47-4x$	$4{,}93-x$		$2x$	$2x$

$$V_f\ Cl_2 = V_f\ H_2O = 2x = 1{,}05\ dm^3$$
$$x = 0{,}525\ dm^3$$
$$V_f\ HCl = 2{,}47 - 4 \cdot 0{,}525 = 0{,}365\ dm^3$$
$$V_f\ O_2 = 4{,}93 - 0{,}525 = 4{,}405\ dm^3$$
$$V_f\ totale = 6{,}87\ dm^3$$

$$1\ atm = 1{,}01325\ bar$$
$$R = 0{,}08206\ \frac{L \cdot atm}{K \cdot mol} = 0{,}08315\ \frac{dm^3 \cdot bar}{K \cdot mol}$$

$$P_{tot} = 1{,}01 \cdot 10^5\ Pa = 1{,}01\ bar$$

$$n_{tot} = \frac{1{,}01 \cdot 6{,}87}{0{,}08315 \cdot 673} = 0{,}124\ mol$$

$$n_i\ HCl = \frac{1{,}00\ dm^3 \cdot 1\ bar}{0{,}08315\ \frac{dm^3 \cdot bar}{K \cdot mol} \cdot 273\ K} = 0{,}0441\ mol$$

$$n_i\ O_2 = \frac{2{,}00\ dm^3 \cdot 1\ bar}{0{,}08315\ \frac{dm^3 \cdot bar}{K \cdot mol} \cdot 273\ K} = 0{,}0881\ mol$$

	$4\,HCl$	$+\ O_2$	$\rightleftharpoons$	$2\,H_2O$	$+2Cl_2$
n_i	0,0441	0,0881		0	0
Δ	$-4x$	$-x$		$+2x$	$+2x$
n_f	$0,0441-4x$	$0,0881-x$		$2x$	$2x$

$n_{tot} = 0,132 - x$
$0,124 = 0,132 - x$
$x = 0,0082\ mol$

$n_f\,HCl = 0,0441 - 4 \cdot 0,0082 = 0,0114\ mol$
$n_f\,O_2 = 0,881 - 0,0082 = 0,0800\ mol$
$n_f\,H_2O = n_f\,Cl_2 = 2 \cdot 0,0082 = 0,0163\ mol$

$x_{HCl} = 0,0114\ mol / 0,124\ mol = 0,0922$
$x_{O_2} = 0,0800\ mol / 0,124\ mol = 0,645$
$x_{H_2O} = x_{Cl_2} = 0,0163\ mol / 0,124\ mol = 0,131$

$P_{HCl} = 0,0922 \cdot 1,01\ bar = 0,0932\ bar$
$P_{O_2} = 0,645 \cdot 1,01\ bar = 0,651\ bar$
$P_{H_2O} = P_{Cl_2} = 0,131 \cdot 1,01\ bar = 0,133\ bar$

$$K_p = \frac{P_{H_2O}^2 \cdot P_{Cl_2}^2}{P_{HCl}^4 \cdot P_{O_2}} = \frac{0,133^2 \cdot 0,133^2}{0,0932^4 \cdot 0,651} = 6,35$$

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