

2021

A7

$$1) \text{ HCl} = 300 \text{ g あり}$$

$$\frac{300 \text{ g}}{92.1 \text{ g/mol}} = 3.257 \text{ mol}$$

$$\text{キゼン} = 700 \text{ g あり}$$

$$\frac{700 \text{ g}}{106 \text{ g/mol}} = 6.604 \text{ mol}$$

$$\text{よって 全物質量は}$$

$$\underline{\underline{9.861 \text{ mol}}}$$

$$\text{よって HCl のモル分率は } \frac{3.257}{9.861} = \underline{\underline{0.330}}$$

$$2) \text{ Raoult's law}$$

$$y_i P = x_i P_i^{\text{sat}}$$

$$\text{よって } y_i = \frac{x_i P_i^{\text{sat}}}{P} = \frac{0.330 \times 161 \text{ kPa}}{101.3 \text{ kPa}} = \underline{\underline{0.524}}$$

$$3) \text{ 残留液の質量は } 1000 - 355 = 645 \text{ g}$$

$$\text{HCl} = 645 \times 0.15 = 96.75 \text{ g あるので}$$

$$\text{HCl} = \frac{96.75 \text{ g}}{92.1 \text{ g/mol}} = 1.05 \text{ mol}$$

$$\text{キゼン} = 645 - 96.75 = 548.25 \text{ g あるので}$$

$$\text{キゼン} = \frac{548.25 \text{ g}}{106 \text{ g/mol}} = 5.17 \text{ mol}$$

$$\text{よって 残留液の物質量は } \underline{\underline{6.22 \text{ mol}}}$$

$$\text{HCl のモル分率は } \frac{1.05}{6.22} = \underline{\underline{0.169}}$$

濃縮液の物質量は

$$\text{HCl} = 3.257 - 1.05 = 2.207 \text{ mol}$$

$$\text{キゼン} = 6.604 - 5.17 = 1.434 \text{ mol}$$

$$\text{よって HCl のモル分率は } \frac{2.207}{3.641} = \underline{\underline{0.606}}$$