

## Example Answers

International Master's Programs of Chemical Engineering in the Graduate School of Engineering,  
Kyushu University (Academic Year from April, 2026)

科目 / Subject : 化学热力学 / Chemical thermodynamics (1 枚 / 1 sheet)

1. (30 点 / 30 points)

(1.1)

(i)  $\Delta S(\text{gas}) = +11.5 \text{ J K}^{-1}$

$$\Delta S(\text{surroundings}) = -11.5 \text{ J K}^{-1}$$

$$\Delta S(\text{total}) = 0$$

(ii)  $\Delta S(\text{gas}) = +11.5 \text{ J K}^{-1}$

$$\Delta S(\text{surroundings}) = 0$$

$$\Delta S(\text{total}) = +11.5 \text{ J K}^{-1}$$

(iii)  $\Delta S(\text{gas}) = 0$

$$\Delta S(\text{surroundings}) = 0$$

$$\Delta S(\text{total}) = 0$$

(1.2)  $\Delta G = +9.90 \text{ kJ}$

$$\Delta G_m = +1.60 \text{ kJ mol}^{-1}$$

2. (20 点 / 20 points)

(2.1)  $\rho = 0.79 \text{ g cm}^{-3}$

(2.2)  $M_c = 500 \text{ g mol}^{-1}$