

Chemical Foundations

① They are not equivalent. Doubling the Kelvin temp would be the larger increase.

$$\text{E.g. } 10^{\circ}\text{C} \times 2 = 20^{\circ}\text{C} \quad (10^{\circ}\text{C increase})$$

$$283 \text{ K} \times 2 = 566 \text{ K} \quad (283 \text{ K increase})$$

- ②
- | | |
|----------------|------------|
| a) salt water | d) helium |
| b) raisin bran | e) melting |
| c) water | f) rusting |

③ a) $8.43 \cancel{\text{ cm}} \times \frac{10 \cancel{\text{ mm}}}{1 \cancel{\text{ cm}}} = 84.3 \text{ mm}$

b) $2.41 \times 10^2 \cancel{\text{ cm}} \times \frac{1 \cancel{\text{ m}}}{100 \cancel{\text{ cm}}} = 2.41 \text{ m}$

c) $294.5 \cancel{\text{ nm}} \times \frac{10^{-9} \cancel{\text{ m}}}{1 \cancel{\text{ nm}}} \times \frac{100 \cancel{\text{ cm}}}{1 \cancel{\text{ m}}} = 2.945 \times 10^{-5} \text{ cm}$

d) $1.445 \times 10^4 \cancel{\text{ m}} \times \frac{1 \cancel{\text{ km}}}{1000 \cancel{\text{ m}}} = 14.45 \text{ km}$

e) $235.3 \cancel{\text{ m}} \times \frac{1000 \cancel{\text{ mm}}}{1 \cancel{\text{ m}}} = 235300 \text{ mm}$

f) $903.3 \cancel{\text{ nm}} \times \frac{10^{-9} \cancel{\text{ m}}}{1 \cancel{\text{ nm}}} \times \frac{1 \cancel{\mu\text{m}}}{10^{-6} \cancel{\text{ m}}} = 0.9033 \mu\text{m}$

④ a) $T_K = 39.2 + 273 = 312.2 \text{ K}$

b) $T_K = (-25) + 273 = 248 \text{ K}$

c) $T_K = (-273) + 273 = 0 \text{ K}$

d) $T_K = 801 + 273 = 1074 \text{ K}$

⑤ a) $T_C = 233 - 273 = -40^\circ\text{C}$

b) $T_C = 4 - 273 = -269^\circ\text{C}$

c) $T_C = 298 - 273 = 25^\circ\text{C}$

d) $T_C = 3680 - 273 = 3407^\circ\text{C}$

⑥ a) $5 \text{ ~~cent~~} \times \frac{0.200 \text{ g}}{\text{cent}} \times \frac{1 \text{ cm}^3}{3.51 \text{ g}} = 0.285 \text{ cm}^3$

b) $2.8 \text{ mL} \times \frac{1 \text{ cm}^3}{1 \text{ mL}} \times \frac{3.51 \text{ g}}{1 \text{ cm}^3} = 9.83 \text{ g}$

⑦ a) pure

b) mix

c) mix

d) pure

e) mix

f) pure

g) mix

h) pure