Alcohol

Alcoholic beverages

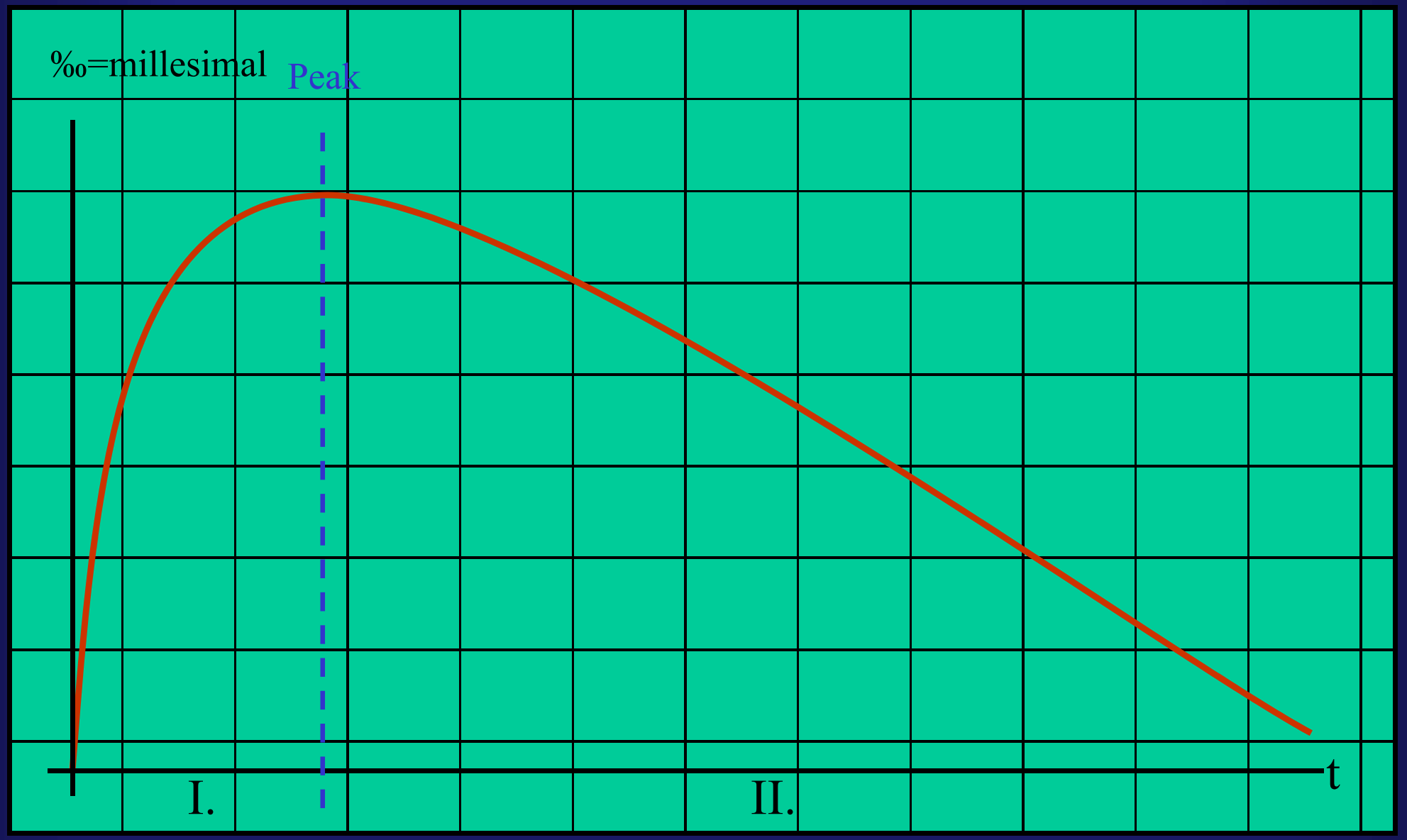
- Beer

  10° = 4 vol. % (3.16 g v 0.1 l = 15.8 g v 0,5 l)
  12° = 5 vol. % (3.95 g v 0.1 l = 19.7 g v 0,5 l)

- Wine – cca 11% (7.9 g v 0.1 l = 15.8 g v 0.2 l)

- Spirits – 40 % (31.6 g v 0.1 l = 15.8 g v 0,05 l)

Blood-alcohol concentration (BAC)



Absorption

- Fullness and content of the stomach
- CO_2 content
- Concentration
- Temperature

Metabolism of ethanol

- ADH (alcoholdehydrogenase)
- MEOS (microsomal ethanol oxidation system)
- Catalase

1. Alcohol
2. Acetaldehyde
3. CO_2 and water

Velocity of elimination

- 0.12 – 0.20 g/kg per hour

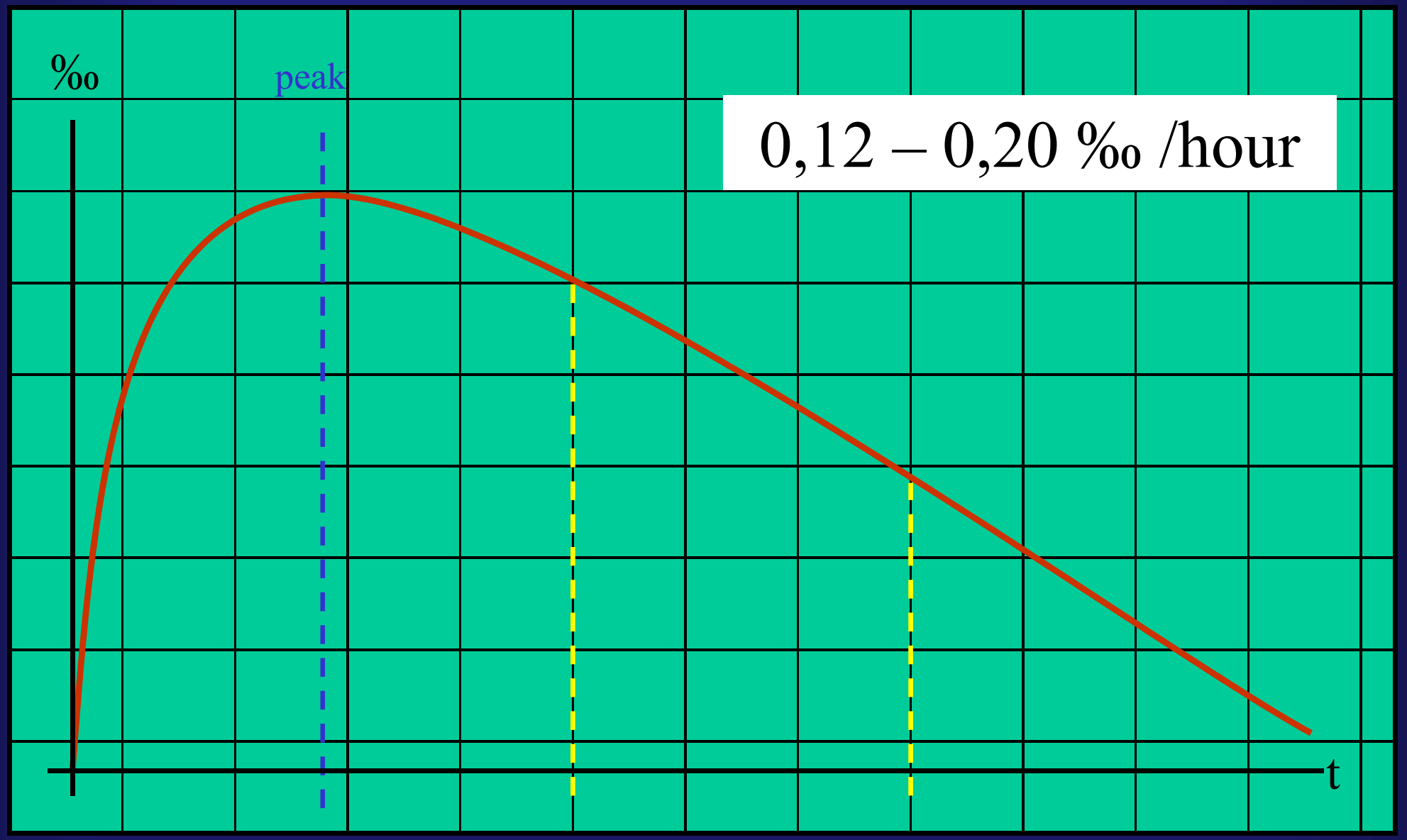
Analysis of alcohol

1. Specific gas chromatography – physical method
2. Non-specific Widmark´s proof – chemical method

Calculation

1. Backward calculation
2. Balance calculation

Backward calculation



Balance calculation (formula)

$$\text{BAC } ‰ = \frac{\text{Alcohol (g)} - \text{absorption deficit}}{\text{Weight (kg)} \times \text{reduction factor}}$$

absorption deficit = 10%

reduction factor: ♀ = 0.6

♂ = 0.7

Example

- Man (weight 70 kg) drank from 7.00 p.m. till 9.00 p.m. five snifters „shots“ (0.05 l) of vodka (40 vol. %).
- ? BAC at 11.00 p.m. ?

Example - result

$$C_t = \frac{79 - 7.9}{70 \times 0.7} - 0.20 \times 4 = 0.65$$

$$C_t = \frac{79 - 7.9}{70 \times 0.7} - 0.12 \times 4 = 0.97$$

$C_t = 0.65 – 0{,}97$ g/kg