CHO cell viability in CO_2 saturated media

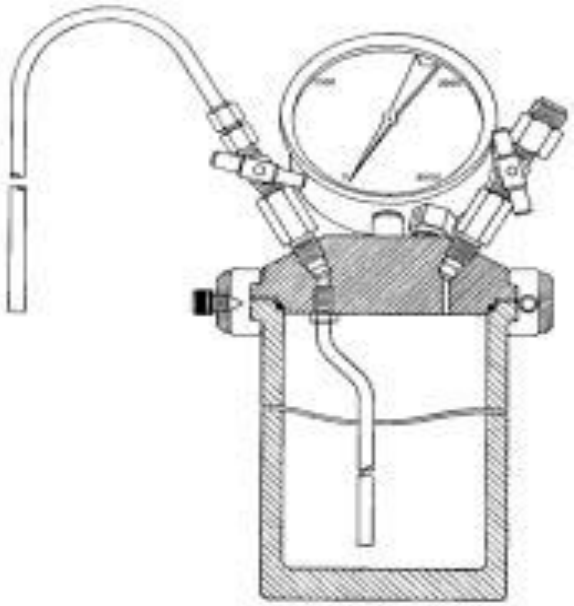
A. Štefanič, J. Jelenc, A. Osterman, M. Dular, D. Miklavčič and A. Maček Lebar

Introduction

- Food preservation
  - Thermal food preservation
  - Nonthermal food preservation
    - High hydrostatic pressure
    - Electroporation
    - Rapid decompresssion
    - High-pressure carbon dioxide
      - Subcritical CO_2
      - Supercritical CO_2

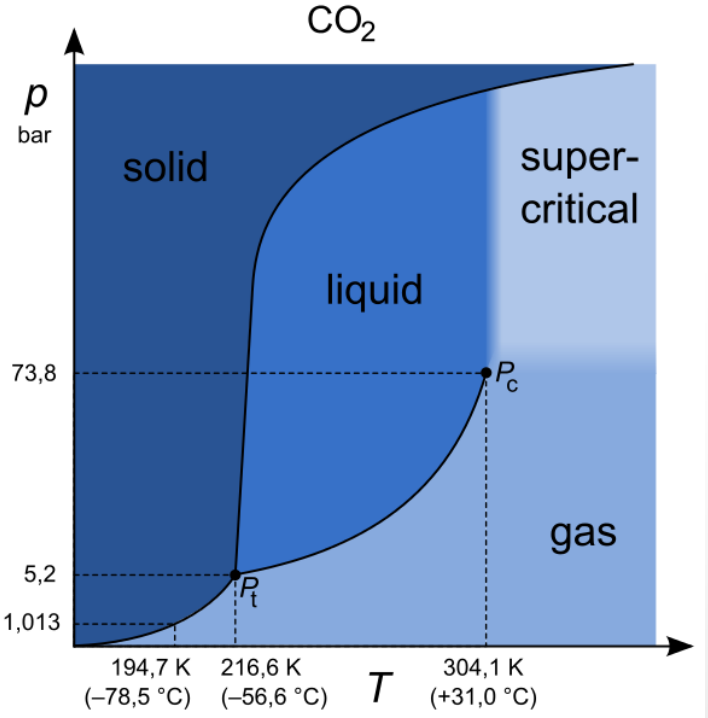
Introduction

- Rapid decompresssion



Introduction

- High-pressure carbon dioxide
  - Tc = 31.1 °C and Pc = 7.38 MPa
    - Diffuse through solid like a gas,
    - and dissolve materials like a liquid.



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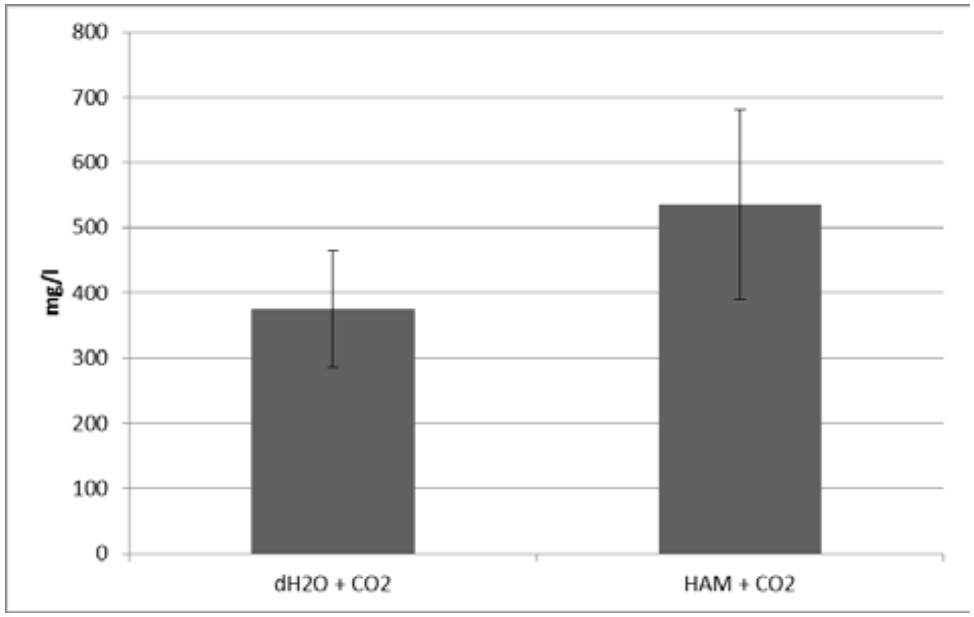
- Cells in CO_2 saturated media
- 24 hour cell viability

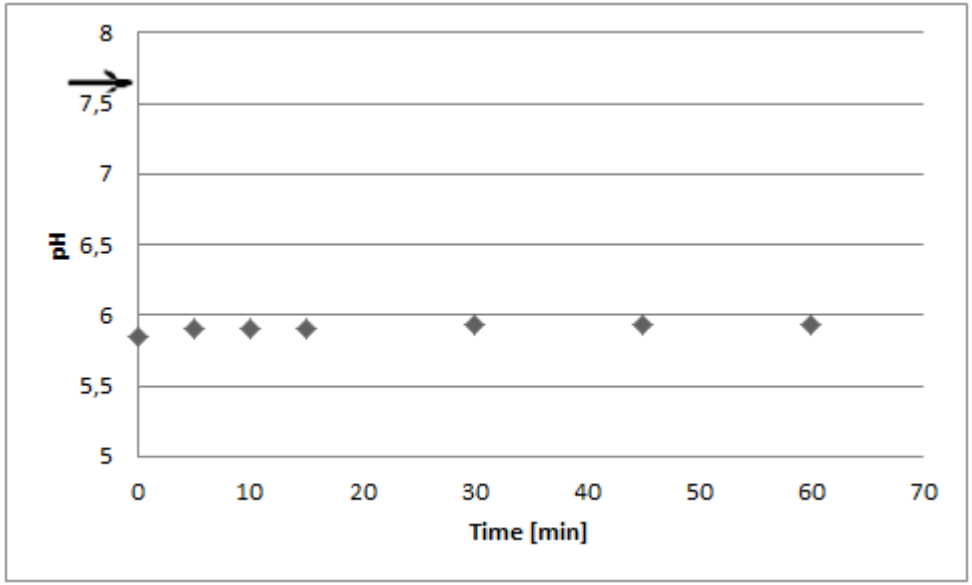
Results

- Concentration of CO_2 in distilled water and in CO_2 saturated HAM media



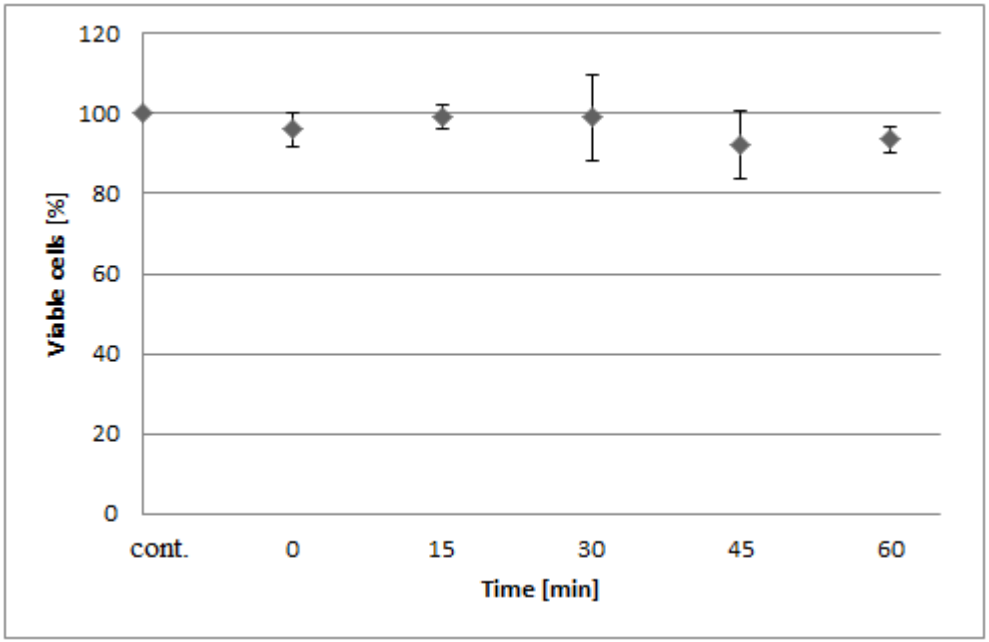
Results

- pH of CO_2 saturated HAM media



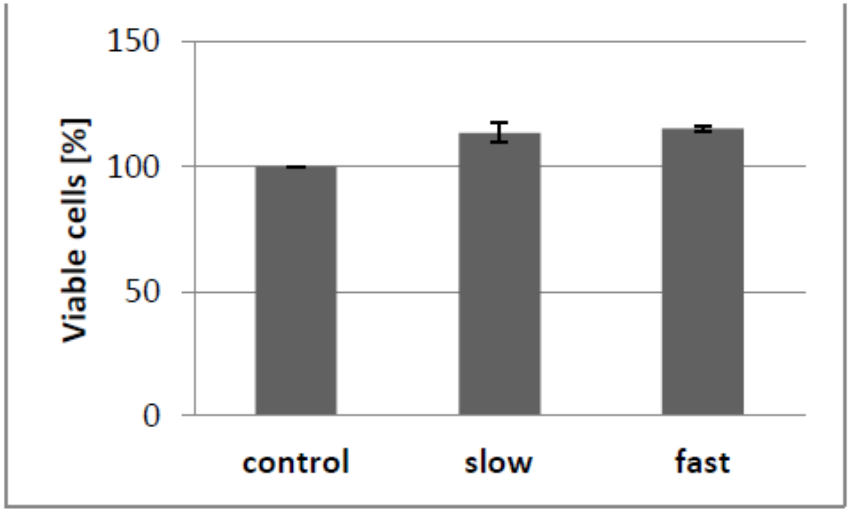
Results

- Cell viability in CO_2 saturated medium



Results

- CO_2 Cell bomb



Discussion

- Concentration of dissolved CO_2 in the cell medium HAM is 535.1 mg/l;
- CO_2 reacts with H_2O and forms carbonic acid;
- 45 minute exposure of cells to the medium with added CO_2 does not affect the cel survival;
- Slow and fast decompression at relaticelv low pressure of 500 kPa, has no adverse effect in cells.