



Penning measurement programme

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Introduction

Measured gain curves in cylindrical geometry for

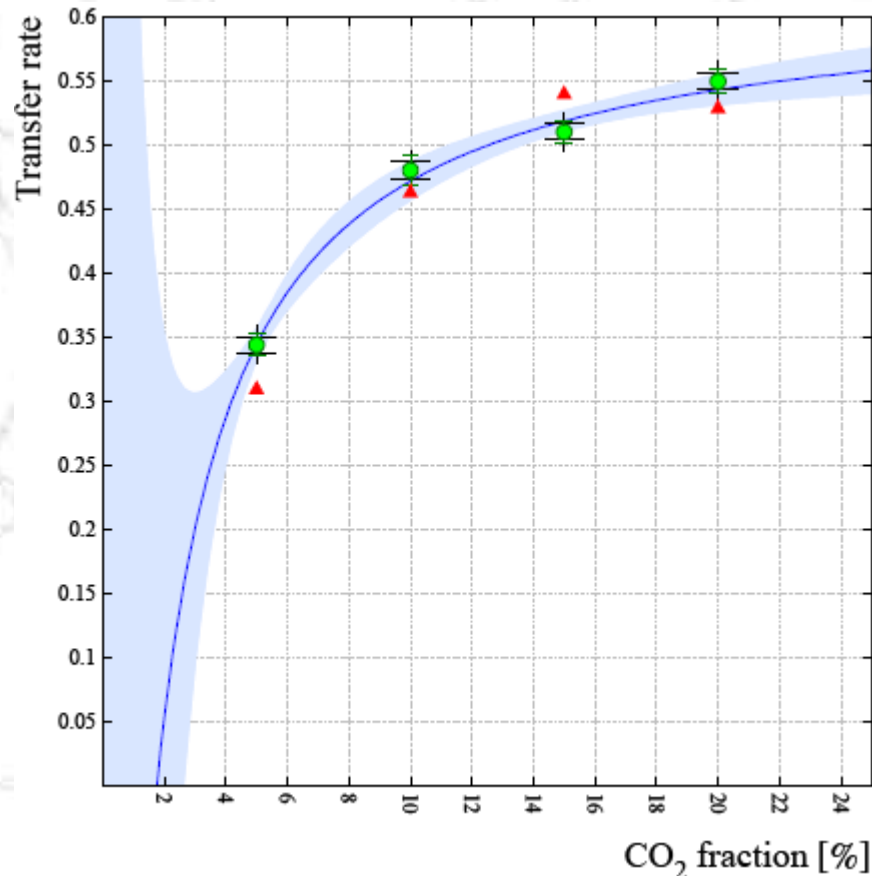
Ar-CO₂ , Ar-Xe , Ar-CH₄ , Ar-C₂H₆ , Ar-C₃H₈ ,
Ar-C₂H₂ , Ar-iC₄H₁₀

Measurements are needed;

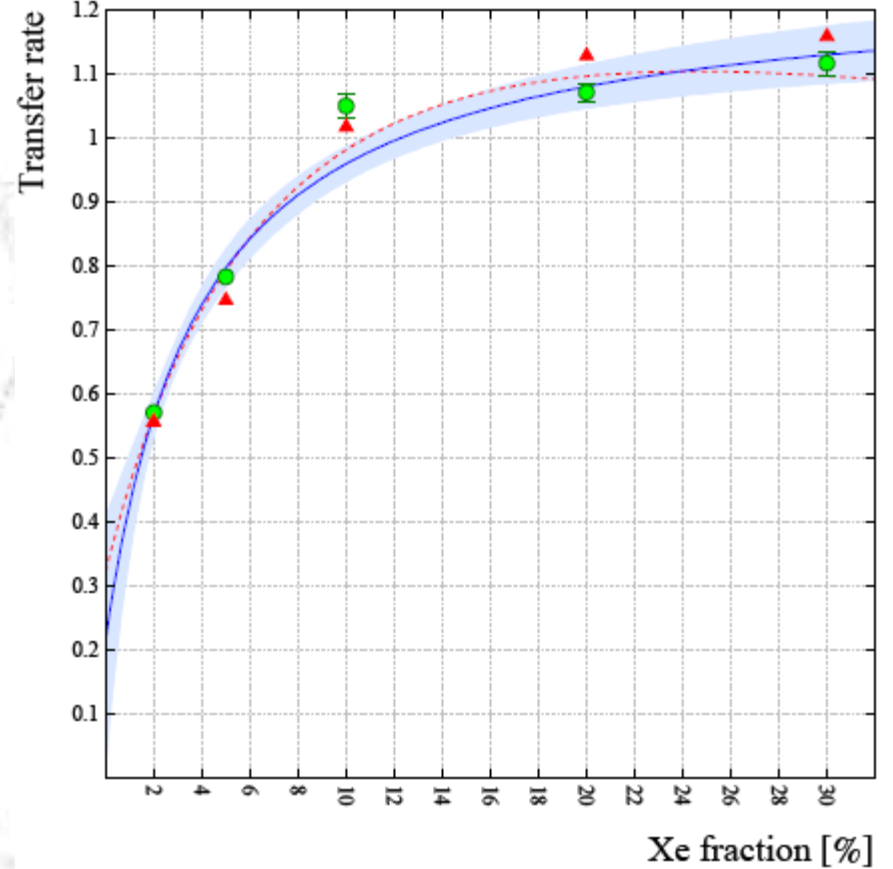
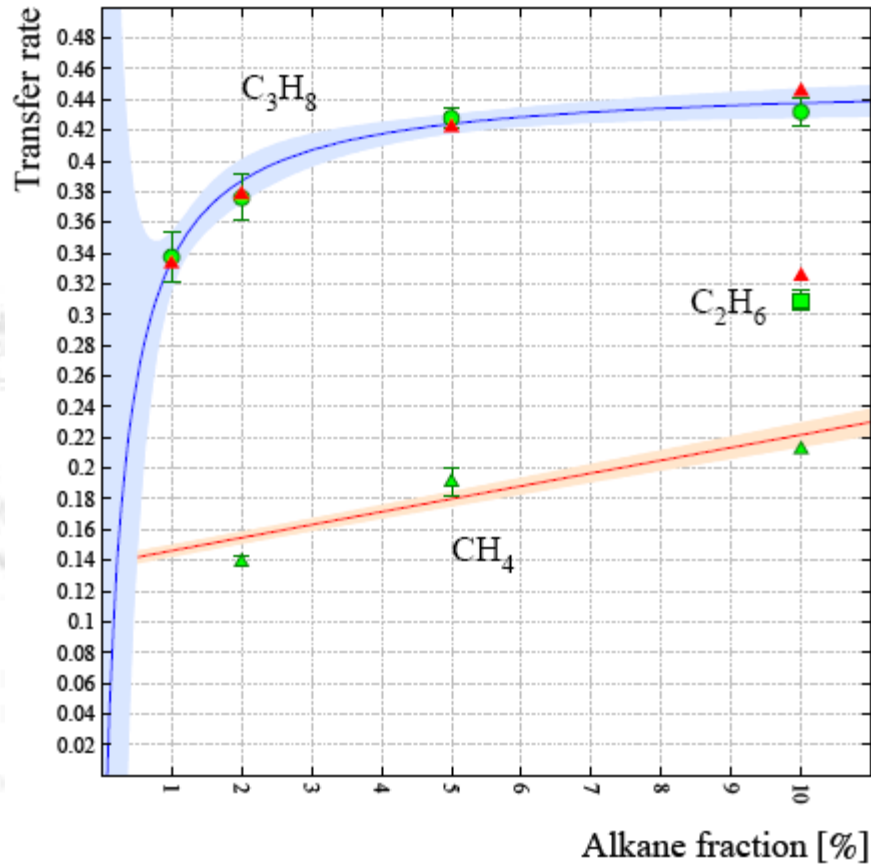
- relevant mixtures
- concentrations & pressures
- excellent calibration

Argon-carbon dioxide

There is little data on Ar-CO₂ while this is likely to remain a base-line gas in detectors.



Argon-propane, argon-xenon

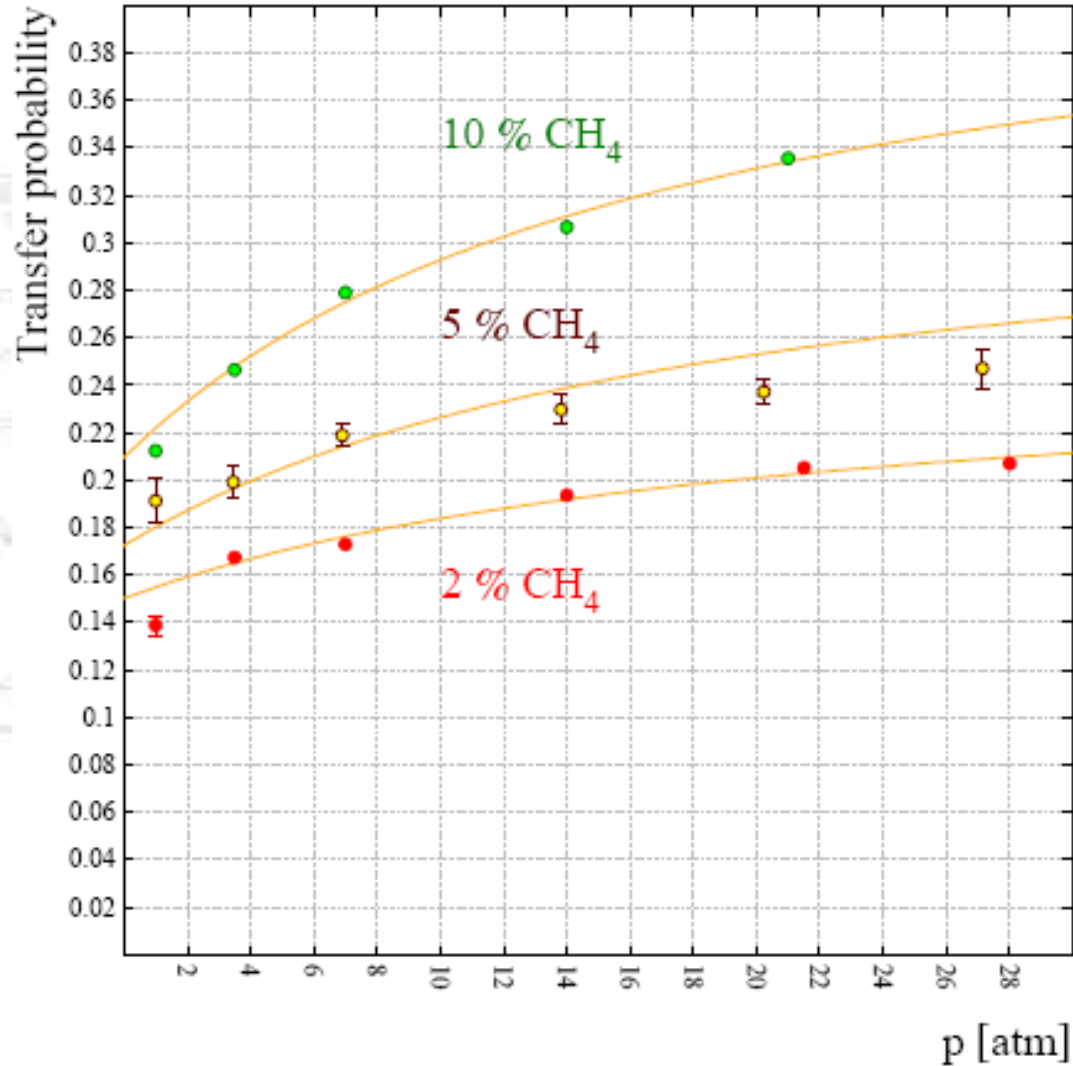


Concentrations & pressures

The penning transfer parameters are calculated by comparing different concentrations and pressures.

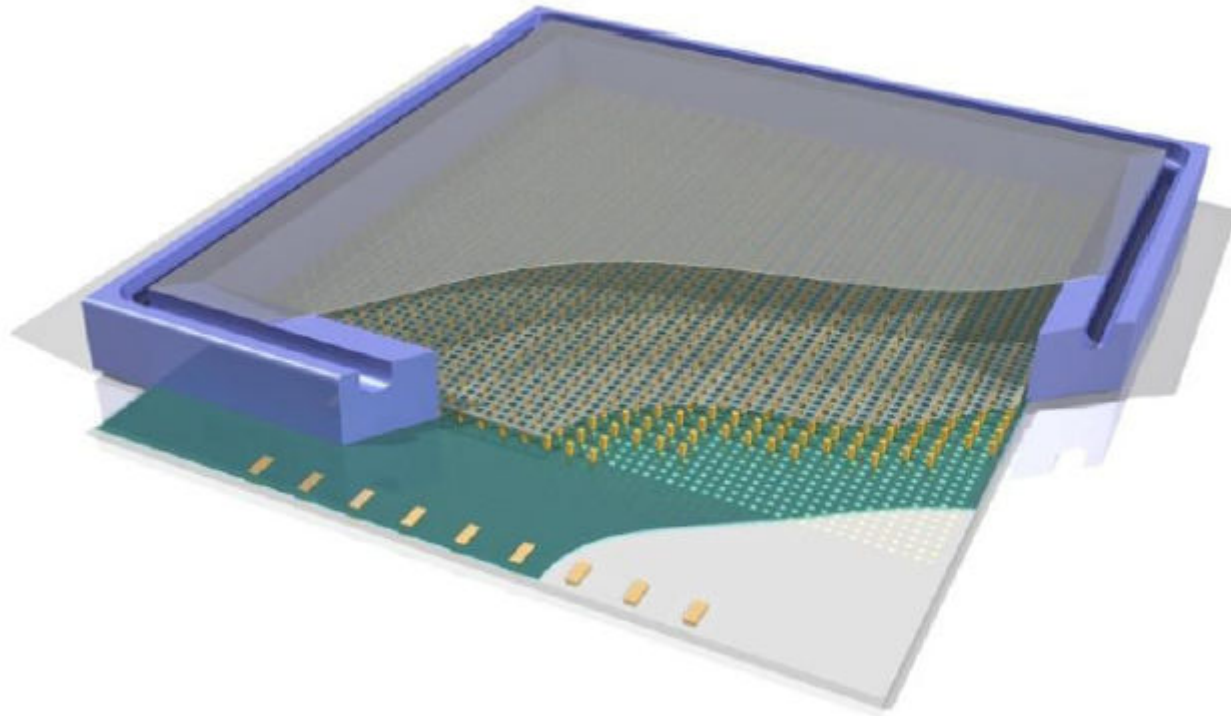
Very low quencher concentrations are particularly valuable for the transfer speed while very high quencher concentrations are needed for transfer efficiencies.

Argon-methane



DME-CO₂

GridPix/Gossip detectors are used DME-CO₂ mixtures.



Excellent calibration

There is considerable uncertainty (up to a factor of 10) in the absolute gain – the relative gain is generally known with more accuracy.

Various reasons are advanced for this, such as uncertainty in the work function and calibration of the equipment.

Also temperature variations can change the gain by changing the density N . The effect increases with the gain and gases at high pressure.

Conclusion

Precise measurements over a broad range of pressures and concentrations enables us to construct a microscopic model that describes penning transfers both in space and in time.

Parallel plate chambers are ideal, but a Micromegas would also be perfectly suited.

A laser as source would be more suited than ^{55}Fe

A microscopic image of plant tissue, showing a network of thin, light-colored cell walls. A prominent feature is a large, circular cell on the left side, which appears to be a cross-section of a vascular bundle or a similar specialized cell. The overall structure is complex and interconnected. A horizontal blue gradient bar is positioned at the top of the image.

Thank You