

Aussois 21-26 Juin 2008



Un peu de sérieux s'il vous plaît, 5 s...



Et relâche... pour certains seulement



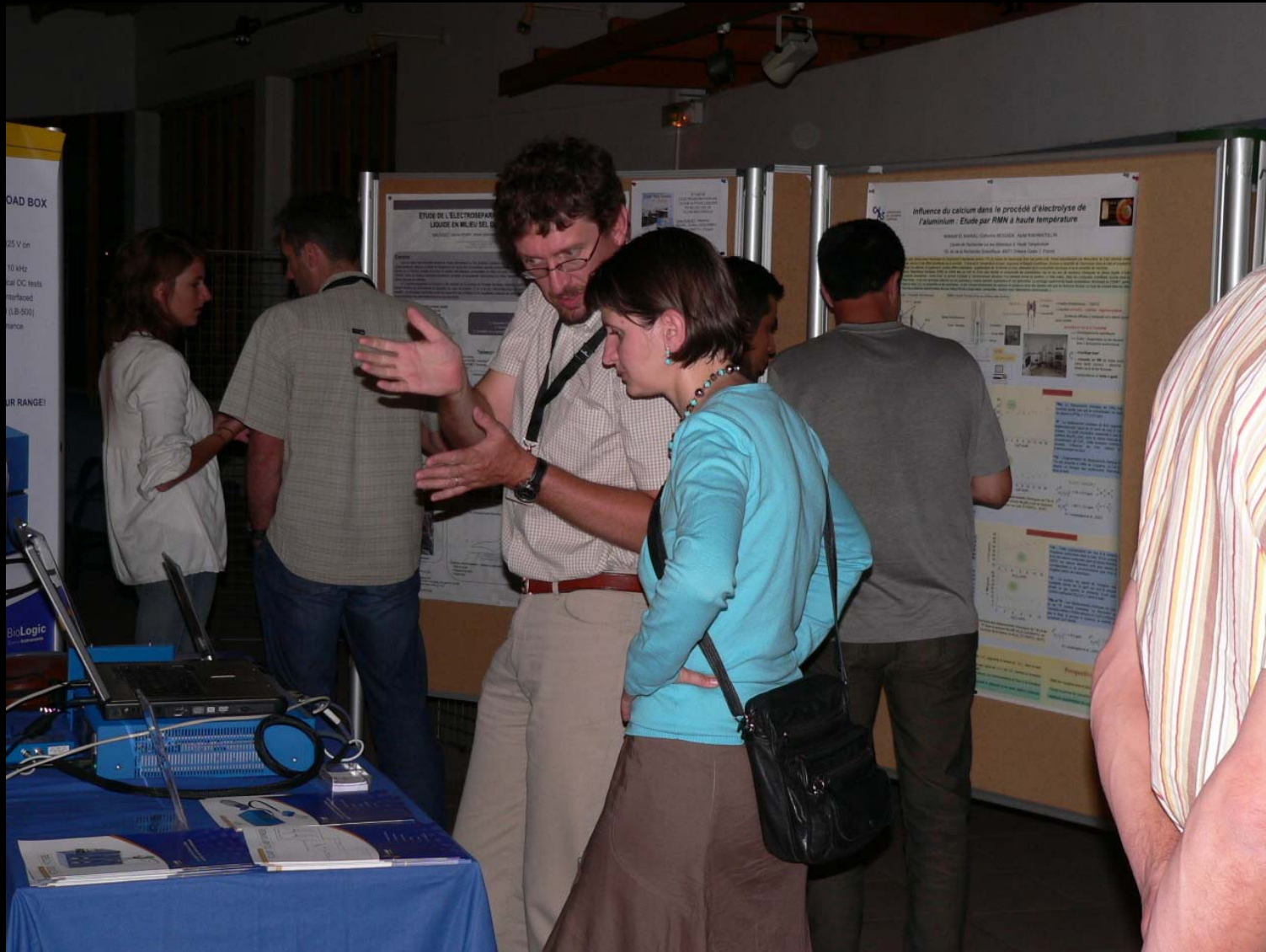
Quelques rares photos d'amphi car là on est prié d'être concentré...



Désolés pour le flou, on a oublié le flash



Des discussions...



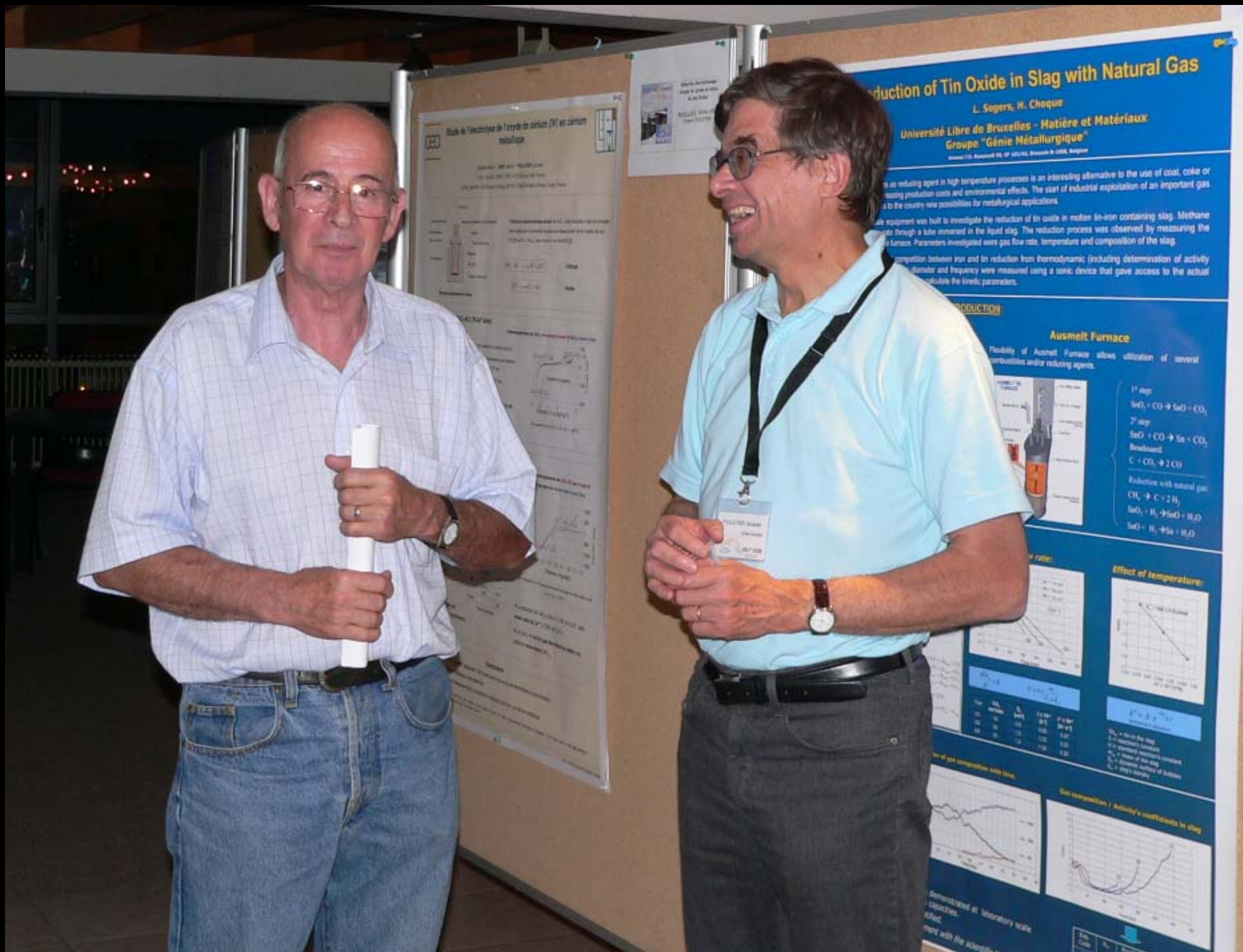












Reduction of Tin Oxide in Slag with Natural Gas

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As a reducing agent in high temperature processes is an interesting alternative to the use of coal, coke or gas, reducing production costs and environmental effects. The start of industrial exploitation of an important gas source in the country here possibilities for metallurgical applications.

Equipment was built to investigate the reduction of tin oxide in molten tin-iron containing slag. Methane was used as a gas through a tube immersed in the liquid slag. The reduction process was observed by measuring the weight of the slag. Parameters investigated were gas flow rate, temperature and composition of the slag.

Competition between iron and tin reduction from thermodynamic (including determination of activity coefficients) and kinetic (including determination of frequency factor) parameters were measured using a sonic device that gave access to the actual reduction rate.

INTRODUCTION

Ausmelt Furnace

Flexibility of Ausmelt Furnace allows utilization of several different fuels and reducing agents.

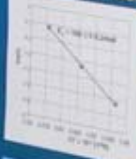


- 1st step:
 $\text{SnO}_2 + \text{CO} \rightarrow \text{SnO} + \text{CO}_2$
- 2nd step:
 $\text{SnO} + \text{CO} \rightarrow \text{Sn} + \text{CO}_2$
- Reduction:
 $\text{C} + \text{CO}_2 \rightarrow 2 \text{CO}$

Reduction with natural gas:
 $\text{CH}_4 \rightarrow \text{C} + 2 \text{H}_2$
 $\text{SnO}_2 + \text{H}_2 \rightarrow \text{SnO} + \text{H}_2\text{O}$
 $\text{SnO} + \text{H}_2 \rightarrow \text{Sn} + \text{H}_2\text{O}$



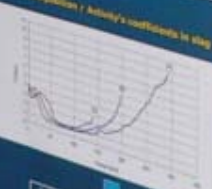
Effect of temperature



$k = A \cdot e^{-\frac{E_a}{RT}}$
 E_a = activation energy
 A = pre-exponential factor
 R = gas constant
 T = absolute temperature



Gas composition / Activity's coefficients in slag

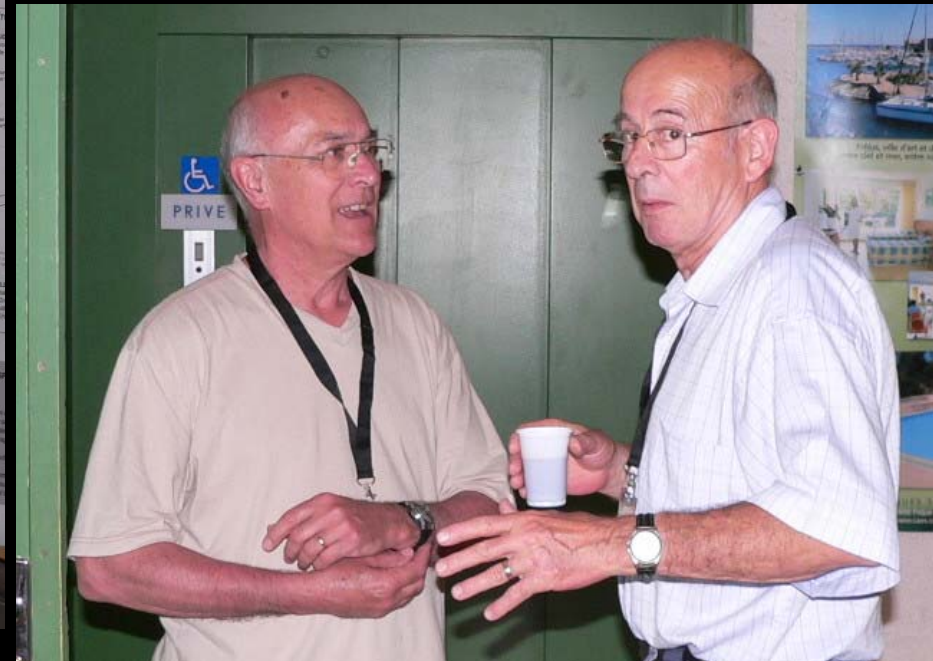


Demonstrated at laboratory scale
 Capabilities:
 - High temperature
 - High pressure
 - High purity

Photographie incognito...



...pas toujours



Encore des discussions.
Au même endroit mais les sujets ne
sont pas les mêmes sans doute...















Moments joyeux ...



Et moments de recueillement





À moins que çà ne soit de la fatigue



Certains ont un peu raté la marche...



Mais tout le monde
est rentré puisque
Pierre a pu regagner
Toulouse Samedi.

Au revoir à tous,
Merci d'être venus



N'oublions pas les bagages...