

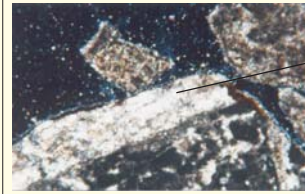
# Extraction of Mg from Dolomite

## Aims of the Research Project:

- Study of thermal characteristics of Dolomite Ore.
- Possibility of using *Shahreza* dolomite to produce Mg via Silicothermic process.

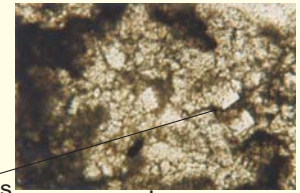


## Ore Characteristics Observed by Transmission Microscope and DTA:



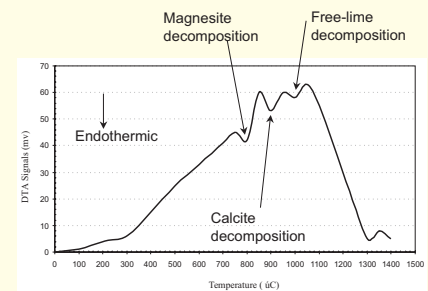
Calcite veinlet

a



Fe-Oxides

b



c

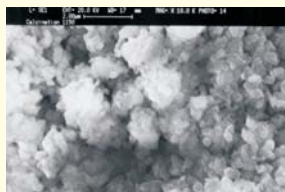


## Phenomena Observed from DTA:

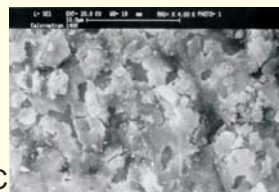
Three-stage decomposition of Dolomite at 800°C, 900°C and 1050°C.

## Calcination Experiments in Muffle Furnace:

- Sintering observed at 1400°C.
- Increase in calcination degree from 63,5% to 96,41% with temperature increase from 800°C to 1400°C.
- Calcination at 800°C was not influenced by time.



a) 1150°C



b) 1400°C

SEM analysis of calcined dolomite



## Magnesium Reduction in "Pidgeon" Furnace:



Pidgeon reduction reactor

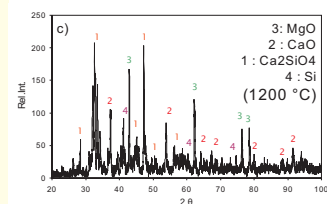
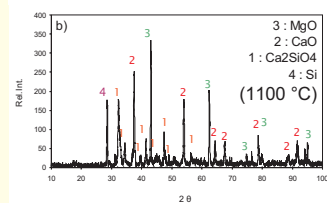
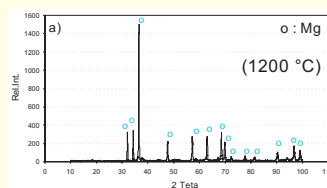
### Tests Parameters:

T= 1100, 1150 and 1200°C

T= 30 Min

P= 0,1 Torr

Inert Gas= Nitrogen



XRD patterns of condensed Mg and remained briquettes



## Final Results from Pidgeon Mg-Reduction:

- Using vacuum and inert gas atmosphere, Mg production from *Shahreza* Dolomite is possible.
- Increase of reduction temperature from 1100°C to 1200°C leads to an increase in reduction degree; however, non-reacted Ca-Mg oxides have been always detected in briquettes after reduction.
- Due to the low amount of K<sub>2</sub>O and Na<sub>2</sub>O in *Shahreza* Dolomite ore, it has a good potential to achieve the high purity Magnesium.