

UMSAEP UM-UWC Linkage Report

April – June, 2018

Visit at MISSOURI S&T, Rolla

**Toward a collaboration to investigate the flotation of Rare Earths metals
(REMs) from phosphogypsum and fly ash**

Submitted by:

Jean-Luc Mukaba, Leslie Petrik

Department of Chemistry, (UWC)

Hosted by Dr. Lana Alagha

Department of Mining and Nuclear Engineering, S&T

1. Introduction

The present report gives an overview about different activities achieved during the visit of Jean-Luc Mukaba to the University of Missouri Science and Technology (M S&T) campus of Rolla. This visit is as the results of academic collaboration between the University of Missouri and the University of the Western Cape on the approved project "Toward a collaboration to investigate the flotation of Rare Earths metals (REMs) from phosphogypsum and fly ash". It is within this collaboration that he had the

During the first month of the visit (2nd- 27

in Figure 2 revealed that 50 weight % of the particles were smaller than 96 nm ($P_{50} = 96$). The particle size distribution in a suspension of phosphogypsum and ethanol was also determined prior to zeta potential analysis. These results are displayed in Figure 3, and showed that the distribution

**Figure 3: Particle Size distribution in a suspension
(5 min and 15 min grinding)**

**Figure 4: Set up of Hallimond tube for micro
flotation**

2.3 Challenges

As stated in section 1.2, one of the objectives of this visit was to perform a few flotation tests at micro and bench scales using respectively Hallimond tube and Denver flotation cells to recover the rare earths elements from phosphogypsum. Unfortunately this task was not achieved due to a few instrumental constraints related to the technical aspects and also the running cost in terms of the characterization of the flotation products (floats and tails). The main characterizations required at this stage were the ICP-OES and XRF for mineral and chemical composition; and the QEM-SCAN was also required for mineral liberation analysis of the phosphogypsum. ICP-OES or XRF analyses were repeatedly required at each flotation test for the characterization of the products while QEM-SCAN was only needed for a once-

Despite the fact

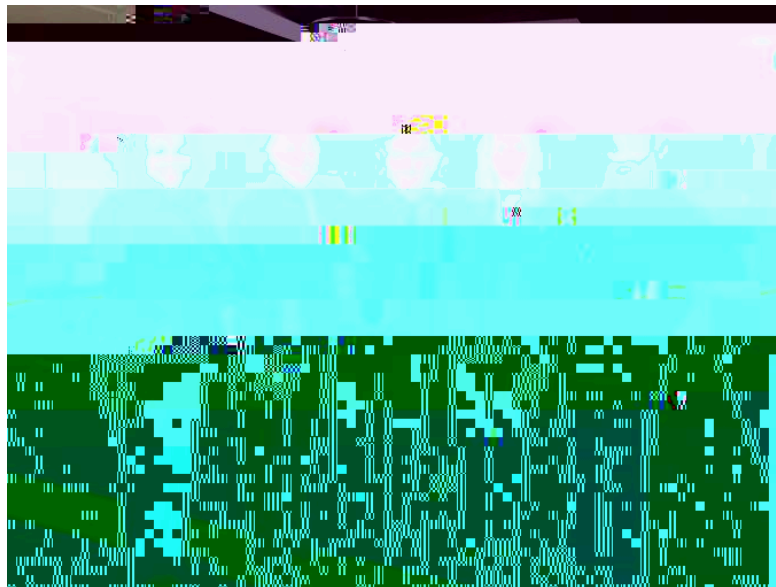
Souvenirs...



Dr. Lana's research group, S&T



Mrs Cindy Boles (International office, S&T)



UMSEAEP's team (Missouri& UWC)



Department seminar presentation, S&T