response surface methodology (RSM) with 3 by 3 factorial experiments with 3 replicates. Results obtained showed that the throughput capacity of 630.97 kg/h; shelling rate 485.34 kg/h and machine efficiency 93.86% of machine is maximum for 129.6 kg/h feed rate and moisture content 16.49 (%) and machine speed of 1026.9 rpm. The machine can be used on commercial farms with these operational results.

**Keywords:** maize sheller, optimization, ANOVA, machine efficiency, throughput capacity and shelling rate.

## F.66. CHARACTERIZATION OF SANDSTONE PORE NETWORK USING MERCURY POROSIMETRY, HELIUM POROSIMETRY AND SCANNING ELECTRON MICROSCOPY

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**Abstract.** Porosity and total pore volume are fundamental properties which are vital in gaining a comprehensive insight into the structure of porous rocks. Sherwood sandstone was characterized using Mercury Intrusion Porosimetry (MIP), Helium Intrusion Porosimetry (HIP) and Scanning Electron Microscopy (SEM). The total intrusion pore volume and total porosity increased after treatment. While the bulk density decreased after treatment. The total accessible porosity was higher in the treated sample (26.95 % MIP and 30.67 % HIP) when compared with the raw (7.41 % MIP and 11.06 % HIP). The total pore volume was also larger in the treated sample (0.1538 mL/g; MIP and 0.231 $gcm^{-3}$ HIP) when compared with the raw (0.0775 mL/g; MIP and 0.116 $gcm^{-3}$ HIP). The helium intrusion had a higher result than the mercury intrusion. These results suggest helium due to its small size must have penetrated smaller and finer pores in the rock samples. The modal pore size moved from 14000 to 24000 nm. These results show that treated has more micro, meso, macro and coarse pores than the raw samples. The densities of the samples determined from HIP and MIP decreased after treatment. SEM shows the difference in surface morphology and textural properties. The raw sample was homogeneous and displayed a fine grain size, while the treated has loose and less dense-packed pore space distribution. These techniques provided more insight into the assessment of porous solids.

**Keywords:** Sandstone, pore volume, porosity, PSD, MIP.

## F.67. TUNING THE CAPABILITY OF AL: $SRTIO_3$ IN PHOTOCATALYTIC APPLICATIONS BY ALTERING THE CHEMICAL COMPOSITION AND PHYSICAL APPEARANCE

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**Abstract.** An efficient photocatalyst is expected to have a large surface area, superior sensitivity to the visible region of the solar spectrum, appropriate band energetics, and agile carrier transport to inhibit recombination processes. In fact, a basic problem remains to be solved, which is the development of novel semiconductors with superior electronic