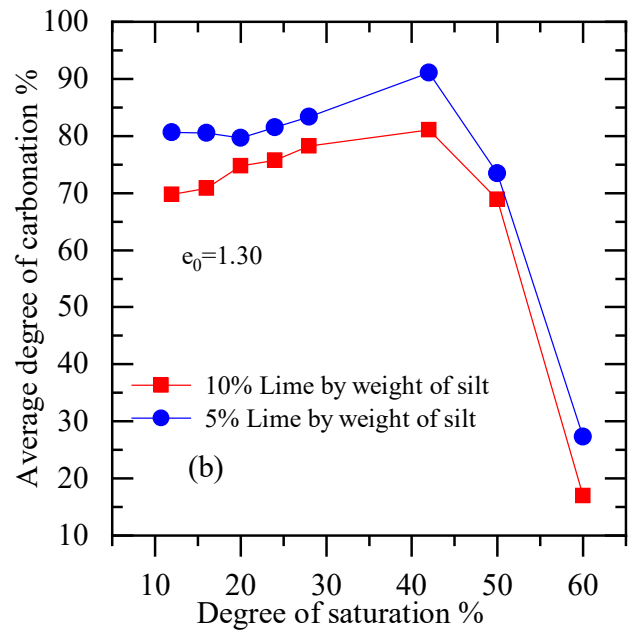
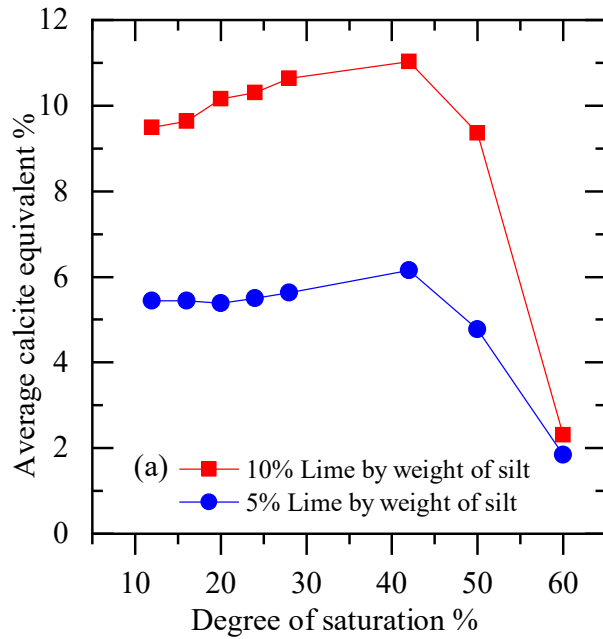
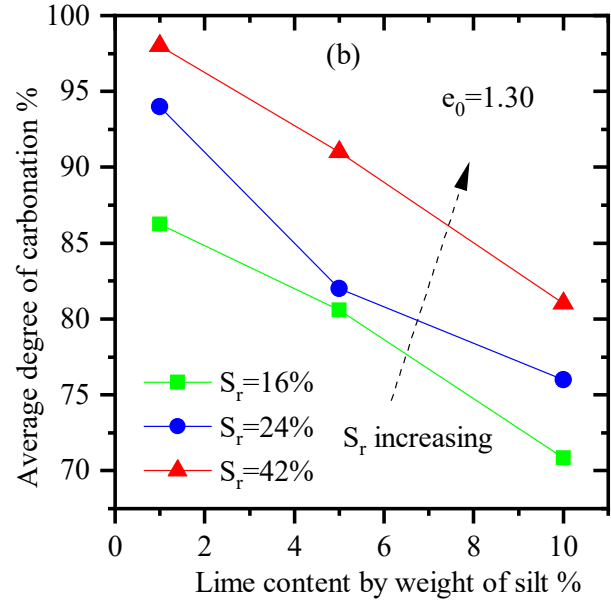
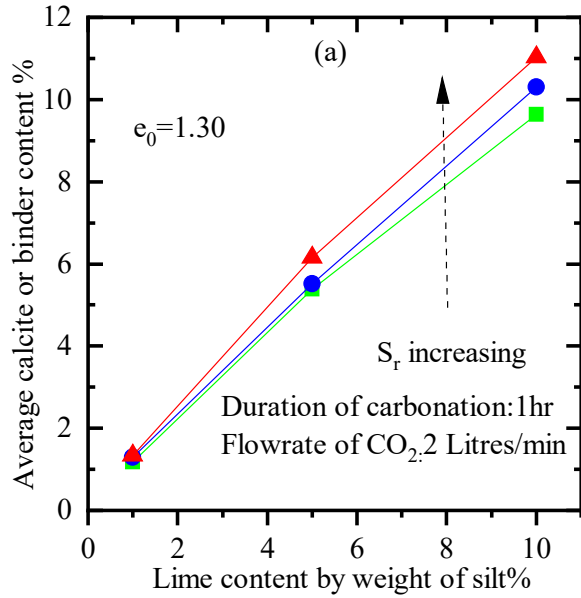


## **Optimum condition for soil carbonation and efficient consumption of CO<sub>2</sub> in a lime-treated silt**

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### **Abstract**

This study investigates some factors affecting the degree of carbonation such as lime content, degree of saturation and the flow rate of CO<sub>2</sub> and how some of these factors influences the efficiency of CO<sub>2</sub> consumption . Silt samples were treated with lime and varying lime content were used for the stabilization of silt which included 5% lime by weight of silt and 10% by weight of silt. It was observed from the study that the degree of carbonation reduces as the lime content in the mix increases because more calcite particles are produced as the lime content in the mix increases which precipitates over the unconverted lime particles in the mix. It was also found from the study that the increasing degree of saturation enhances the formation of calcite and the degree of carbonation, the results for samples treated with both 5% ,1% and , 10% lime by weight of silt showed an increasing degree of carbonation and calcite content as the degree of saturation increases because more water is available as degree of saturation increases for the initial dissolution of lime particles and the CO<sub>2</sub>. The study also indicates that the degree of saturation of 50% and above is not suitable for soil carbonation because the water present in the void impedes the free movement of the CO<sub>2</sub> gas constituting a gas mobility problem which affects the formation of calcite and the degree of carbonation.



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