Reclamation and Revegetation of the Abandoned Coal Mine Land Using Soda Ash Production By-product. (S11-yang092129-Poster)

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Abstract:

The experiment of rainfall simulating lysimeter (32% slopes) was conducted to recycle the soda ash by-product (SABP) from the Solvay process as a reclamation source for stabilizing the wastes in the slopes, re-vegetation, neutralizing the AMD and preventing subsidence. pH and EC of SABP were 11.2 and 79.6 dS/m, respectively. SABP was very fine and contained calcite, quartz and plagioclase minerals. Contents of Ca, Mg and K were 233.8, 50.5 and 2.3 cmol(+)/kg, respectively. Coal wastes were very acidic (pH 4) and contained a high level of Fe, Al and Si. Coal wastes in the slopes were treated with dressing soils and SABP based on lime requirement (LR: 16.6 MT/ha at pH of 7.5). With 100% LR treatment, AMD was neutralized into pH 7-8 but growth of turf and finer glass (Digitaria sanguinalis L.) were very poor due to high salts in the SABP. Treating wastes with SABP at lower than 50% of LR was adequate for re-vegetation. SABP was necessary to formulate to globular or granular form at temperature higher than 600C for treating AMD from a pit mouth and preventing subsidence due to the fineness of the SABP powder. SABP was adequate for slope stabilization and re-vegetation but inadequate for wastewater treatment and subsidence prevention.

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