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Repurposing of Crystalline Solar PV For Sodium Silicate Production

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Abstract : This work is focus on recovering silicon form photovoltaic cells and repurposing it toward the use in glass, ceramics or glass ceramics as it is made up of silicon material. Silicon is the main back-bone and responsible for the thermodynamic properties of glass, ceramics and glass ceramics materials. Antireflection silicon is soluble in hot alkali. Successfully the recovered material composed of silicon and silicon nitride of the A.R, with a small amount of silver, Aluminuim, lead & copper in the sunshine of crystalline/non-crystalline silicon solar cell. Aquaregia is used to remove the silver, Aluminium, lead & copper. The recovered material treated with hot alkali highly concentrated to produce sodium silicate, which is an alkali silicate glass (water glass). This type of glass is produced through chemical process, unlike other glasses that are produced through physical process of melting and non-crystalline solidification. It has showed a property of being alkali silicate glass from its solubility in water and insoluble in alcohol. The XRF analysis shows the presence of sodium silicate.

Keywords : unrecyclable solar PV, crystalline silicon, hot conc. alkali, sodium silicate
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