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# Acca4<sup>th</sup> INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“INTEGRATING CLEANER PRODUCTION INTO SUSTAINABILITY STRATEGIES”

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## **Silicon Sludge Co-Processing for Industrial Symbiosis: A Study Case in a Semiconductor Company**

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### **Abstract**

For the electronics industry, the silicon powder residue, in the form of an aqueous dispersion, is an environmental and economic issue. Therefore, the objective of this work was to analyze the characteristics of such material, through a study case in a semiconductor company, aiming to close the production cycle. The aqueous silicon dispersion which is generated by the silicon wafer grinding and sawing systems was characterized by physical methods and by optical microscopy. This non-product was used in cement test specimens which were submitted to compressive strength tests to determine a potential improvement due to the addition of micro-silica in comparison with regular cement. The results showed that there was a significant increase in the compressive strength indicating the technical feasibility of using this type of non-product from the semiconductor industry in cement fabrication. Although the study showed evidence about the technical feasibility of the use of this non-product, in order to have a viable industrial symbiosis for both companies, the logistics aspects will also play a determinant role to encourage mutual cooperation between the companies.

*Keywords: industrial symbiosis, electronics industry, non-product, silicon*

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