Title: Manufacture of Abrasive Grinding Wheel using Silicon Carbide Abrasive Materials.

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Abstract: Abrasive materials are materials of extreme hardness that are used to shape other materials by a grinding or abrading action and they are used either as loose grains, as grinding wheels, or as coatings on cloth or paper. A grinding wheel is made of very small, sharp and hard silicon carbide abrasive particles or grits held together by strong porous bond. The manufacture of silicon carbide abrasives and grinding wheel in Nigeria has been severely impeded by the difficulty of identifying suitable local raw materials and the associated local formulation for abrasives and grinding wheel with global quality standards. This paper presents a study on the formulation and manufacture of abrasive grinding wheel using silicon carbide abrasive grains in Nigeria. Six local raw material substitutes were identified through pilot study and with the initial mix of the identified materials, a systematic search for an optimal formulation of silicon carbide, the intermediate product, was conducted using the Taguchi method. The mixture was fired in a furnace to 1800oC for 6 hours forming silicon carbide chunks, which were crushed and sieved into coarse and fine grades of abrasive grains. Combining each grade with appropriate proportion of latex binder to form paste in a compressed mould cavity of desired shape and size, coarse and fine grinding wheels of international standard were produced.