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Experimental study on preparation of spherical alumina powder by laminar plasma jet

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For preparing micro-sized spherical alumina powder, the micro-sized  $\gamma$  phase irregular alumina powders with large pore volume were spheroidized in laminar plasma jet generated by a segmented anode non transferred arc laminar plasma torch using nitrogen as plasma gas. The effect of different working parameters of the plasma torch and a powder feeder on the spheroidization rate of the treated powders was investigated. The spheroidization rate was obtained by counting the number of the spherical particles over the total particles shown in images taken by an optical microscope, using reflection method. The spheroidization rate of the treated powders was close to 100%, showing a good performance of the laminar plasma torch. The alumina powders with high spheroidization rate, high dispersion and uniform particle size can be obtained using different combinations of the working parameters of the plasma torch and the powder feeder. In addition, it was shown that high spheroidization rate of the alumina powders can be achieved with the laminar plasma torch working at low power. The main phases of the raw and treated alumina are  $\gamma$  and  $\alpha$ , respectively, characterized by the XRD based on PDF card matching method.

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