

Optical Characteristics of Antireflection Coatings Based on $\text{Al}_2\text{O}_3\text{--SiO}_2$ for Silicon Solar Cells

S. X. Suleymanov (Foreign)¹,

V. F. Gremenok (Foreign)²

V. V. Khoroshko³,

V. A. Ivanov (Foreign)⁴,

V. G. Dyskin (Foreign)⁵,

M. U. Djanklich (Foreign)⁶,

N. A. Kulagina (Foreign)⁷

1, 5, 6 Foreign (Materials Science Institute, SPA “Physics-Sun,”
Academy of Sciences of the Republic of Uzbekistan, Tashkent,
Uzbekistan)

2, 4 Foreign (Scientific-Practical Materials Research Centre, National
Academy of Sciences of Belarus)

2, 3 Belarusian State University of Informatics and Radioelectronics,
220013, Minsk, Belarus

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Abstract: The results from modeling, manufacture, and investigation of the integral reflection coefficient (R_S) of single-layer composite antireflection coatings of $\text{Al}_2\text{O}_3\text{-SiO}_2$ for silicon solar cells with integral reflection coefficient $R_S \leq 10\%$ are presented. It was shown that for Al_2O_3 concentrations of 52–84 wt.%, SiO_2 concentrations of 16–48 wt.%, and thickness of 53–97 nm the smallest values of R_S are 73–77% for Al_2O_3 and 27–23% for SiO_2 with thickness of 69–75 nm. It was shown experimentally that for layers with $\text{Al}_2\text{O}_3:\text{SiO}_2 = 75:25$ wt.% with thickness of 72 nm $R_S = 3.53\%$, which is approximately half of the R_S value for Si_3N_4 .

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