

# Adhesion of Electron-Irradiated Diazoquinone–Novolac Photoresist Films to Single-Crystal Silicon

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- [S. A. Vabishchevich](#),
- [N. V. Vabishchevich](#),
- [S. D. Brinkevich](#),
- [D. I. Brinkevich](#),
- [V. S. Prosolovich](#) &
- [S. B. Lastovskii](#)

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## Abstract

In this work, the effect of irradiation with 5-MeV electrons on the adhesive and strength properties of the films of diazoquinone–novolac photoresists FP9120, SPR-700, and S1813 G2 SP15 deposited on single-crystalline silicon wafers by spin-coating has been studied using the indentation method. It has been established that irradiation leads to an increase in the true microhardness of the photoresist films, most pronounced in SPR-700 films, caused by the crosslinking of phenol–formaldehyde resin molecules. It has been shown that the values of the specific peeling energy  $G$  of photoresist films on silicon increase upon irradiation as a result of the recombination of radicals at the photoresist/silicon interface with the formation of new covalent bonds Si–C and Si–O–C. The observed experimental results are explained taking into account the radiation–chemical and relaxation processes occurring in the bulk of the polymer film and at the interface.

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## Author information

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### Authors and Affiliations

- Polotsk State University, 214400, Novopolotsk, Belarus**  
S. A. Vabishchevich & N. V. Vabishchevich
- Belarusian State University, 220030, Minsk, Belarus**  
S. D. Brinkevich, D. I. Brinkevich & V. S. Prosolovich
- OOO Moi Meditsinskii Tsentri–Vysokie Tekhnologii, 188640, Vsevolozhsk, Leningrad oblast, Russia**  
S. D. Brinkevich
- Scientific and Practical Center for Materials Science, National Academy of Sciences of Belarus, 220072, Minsk, Belarus**  
S. B. Lastovskii

## Corresponding author

Correspondence to [D. I. Brinkevich](#).

## Ethics declarations

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The authors declare that they have no conflicts of interest.

## Additional information

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