

### Modeling study of the preparation of C/C composites in the F-CVI reactor

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The preparation of composites of C/C by the Chemical Vapor Infiltration (CVI) with the pyrolysis carbon from propane was studied. Pyrolysis carbon was deposited in the state of 30 torr and 1,173 K, and the rate of carbon deposition gradually increased with time. The main exiting gas products were composed of methane, ethylene, and acetylene. The changes of those gases' fraction were observed. The fraction of ethylene went down, and the fraction of acetylene increased in proportion to the reaction temperature and the propane concentration. According to the previous reported data, the produced propyl radicals reacted well at a high temperature and at a high propane concentration. In this study, 5%, 20%, and 100% of propane gases were used.

Moreover, the shape changes of deposited carbon in the pores of preform were confirmed by SEM photos. The mathematic modeling of the system with the deposition rate had the similar trend to the estimated experimental data in the reference well.