других характеристик. Результатом моделирования явилось определение диапазона изменения параметров структуры, которые оказывают существенное влияние на динамику процессов переноса электронов. Исходя из полученных результатов моделирования, выработаны рекомендации по созданию и совершенствованию новых приборов с улучшенными выходными параметрами в диапазонах СВЧ и КВЧ. Использование исследованных структур необходимо для создания транзисторов, которые можно применить при разработке приемопередающих модулей, усилителей и других устройств диапазона КВЧ.

PEAT-BASED ELECTROMAGNETIC SHIELDS FOR GROUND OBJECTS PROTECTION AGAINST RADAR DETECTION

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Powdered peat containing materials were studied in combinations with the other materials, which possess electrical or dielectric properties. It was shown, that the electromagnetic shield on the basis of powdered peat with a sufficient thickness is capable of ensuring the reflection coefficient about -6…-8 dB in the frequency range of 6…17 GHz. The origin and type of peat material do not provide a significant difference in electromagnetic characteristics, which means, that their structure and electrophysical properties are provided due to carbon content and the residual moisture content and are rather similar.

Composite materials, comprised of powdered peat and polymer materials, with an increase in the volumetric content of powdered filler are characterized by improved properties contributing to the reduction of the transmission and reflection coefficients within the studied frequency range.

The use of the polymer binder in a composite peat-based material can increase the EMR reflection coefficients within the frequency range of 8.0...12.0 GHz up to due to the moisture stability of the composite, and the change in volume of the organic material in the composite allows a controlled change in reflection coefficients depending on the operation requirements. The smallest reflection coefficient on a metal reflector can be obtained at the level lower than -6 dB for the highbog peat, mixed with polymer gel with the 40% mass. content.

The manufacture procedure of flexible peat-based shields is suggested, which allows to decrease the reflection coefficient of a metal surface to -1…-18 dB in the frequency range of 0.7...17 GHz. The transmission coefficient in the studied frequency range of the suggested material is within the range of 0…–4.6 dB. The reflection coefficient value is smaller, than -8 dB (which is typical for radioabsorbent materials) in the frequency range 12…17 GHz.

A multilayered shielding construction is developed, which allows to widen the bandwidth of radioabsorbent characteristics of the peat-based EM shields. The smallest reflection coefficient value is shown by the sample, with the foamed dielectric layer thickness of 3 mm. The reflection coefficient value varies within the range of -2…-17 dB and is smaller than -8 dB above the frequency of 8 GHz.

OPTICALLY TRANSPARENT ELECTROMAGNETIC SHIELDS FOR SHF BAND

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The analysis of electromagnetic channel of information leakage shows, that side electromagnetic emanations of personal computers and laptops create a significant threat of unauthorized access to information, processed on them. One of the most effective ways to prevent it is to design electromagnetic shielding materials and cases, which are capable to attenuate the electromagnetic power and locate the electromagnetic field within the shielded space. The application of many types of conductive and magnetic materials for the unwanted electromagnetic radiation shielding is limited by the lack of their optical transparency. Thus some parts of a computer – such as the monitor and keyboard – should be protected with those materials, which allow to see the visual information through them, at least partially. Application of polar dielectric liquids produces an effective electromagnetic radiation shielding and acceptable optical visibility. Polymer gels application is a good solution for liquid arranging in a necessary shape. The applied materials and approaches resulted in the electromagnetic radiation shield with a certain shielding efficiency and acceptable visual