

STRENGTH PROPERTIES OF THE COMPOSITES ON THE BASE OF POLYVINYLIDENE FLUORIDE AND EUROPIUM COMPLEXES

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The mechanical and electrical strengths of the composites on the base of polyvinylidene fluoride (PVDF) and EuR_{29} and EuR_{34} europium complexes are investigated in this work. It is established that σ mechanical strength takes maximal value for PVDF+ EuR_{34} composite at 5% EuR_{34} composition and for PVDF+ EuR_{29} composite at 7% EuR_{29} one. It is shown that the electric strength for both composites with the growth of complex increase decreases with further approximation to saturation.

The composite materials prepared on the base of polymers and rare-earth element complexes can be used in different devices (gauges, transformers and etc.).

In the given work the mechanical and electric densities of composites prepared on the basis of polyvinylidene fluoride (PVDF) and EuR_{29} and EuR_{34} europium complexes.

The powder mixes of PVDF, EuR_{29} and EuR_{34} in different component relations produced and later PVDF+ EuR_{29} and PVDF+ EuR_{34} composites in film form with further cooling are obtained from these mixes by the hot compression method at melting point of polymer matrix under pressure 15NPa during 10 minutes. The cooling is carried out by putting of produced films in mixture ice-water with velocity 30 degree/min.

The σ mechanical strength on tension and E electric strength produced composite samples are defined on techniques described in monographs [1] and [2]. The σ mechanical strength and E electric strength are measured at room temperature.

The dependencies of composite mechanical strength σ produced on PVDF basis and EuR_{29} and EuR_{34} europium complexes on complex content are given on fig.1.

It is seen that in both cases the composite mechanical strength increases up to definite value with increase of F complexes moreover if σ maximum value in EuR_{34} complex case corresponds to 5% content then in EuR_{29} complex case it corresponds to 7%.

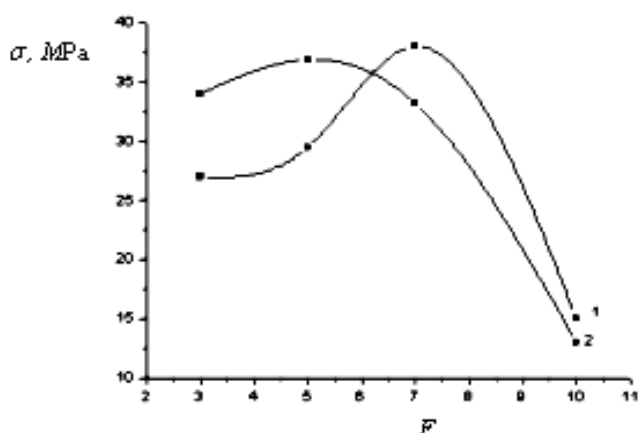


Fig.1. The dependences of composite mechanical strength PVDF + EuR_{29} and PVDF + EuR_{34} on complex content: 1. PVDF+ EuR_{29} , 2. PVDF+ EuR_{34} .

The E composite electric strength dependences of PVDF+ EuR_{29} and PVDF+ EuR_{34} on F europium complex percentage composition are presented on fig.2. As it is seen in both cases the composite electric strength decreases with further approximation to saturation with increase of F content.

The increase of PVDF+ EuR_{29} PVDF+ EuR_{34} composite mechanical strength observed by us, is explained by well distribution degree of europium complexes in polymer matrix [3].

From plots presented on fig.1 it is also seen that σ mechanical strength of PVDF+ EuR_{29} and PVDF+ EuR_{34} composite materials in the dependence on F europium complex content changes very difficultly and it especially if at 3% and 5% for PVDF+ EuR_{34} more than σ for PVDF+ EuR_{29} then at 7% vice versa σ for PVDF+ EuR_{29} more than σ for PVDF+ EuR_{34} . However at 10% of both additions σ of both composites almost coincide.

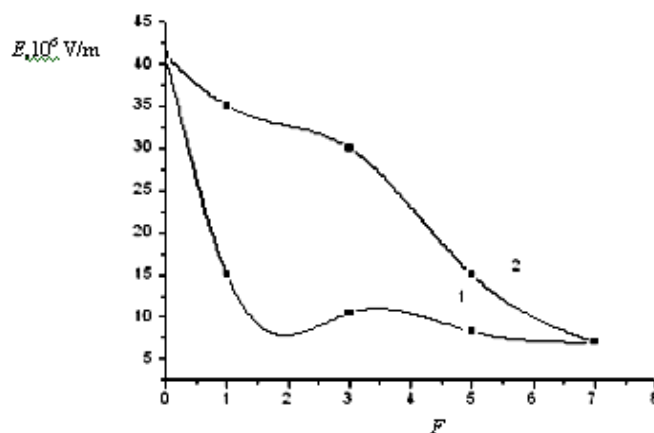


Fig.2. The dependences of composite mechanical strength on europium complex percentage composition: 1. PVDF+ EuR_{29} , 2. PVDF+ EuR_{34} .

As it is seen from plots given on fig.2, the E electric strength of PVDF+ EuR_{34} composite at 1%, 3%, 5% contents of EuR_{34} europium complexes is more than E for PVDF+ EuR_{29} composites at 1%, 3%, 5% contents of europium complexes EuR_{29} . However at 7% the both additions of both composites also coincide.

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POLİVİNİLİDENFTORİD VƏ YEVROPİNİN KOMPLEKSLƏRİ ƏSASINDA ALINMIŞ KOMPOZİTLƏRİN MÖHKƏMLİK XASSƏLƏRİ

İşdə polivinilidenftorid (PVDF) və yevropinin EuR_{29} və EuR_{34} kompleksləri əsasında alınmış kompozitlərin mexaniki və elektrik möhkəmlikləri tədqiq edilmişdir. Müəyyən edilmişdir ki, σ mexaniki möhkəmliyinin maksimal qiyməti PVDF+ EuR_{34} kompoziti üçün EuR_{34} kompleksinin 5% miqdarında, PVDF+ EuR_{29} kompoziti üçün isə EuR_{29} kompleksinin 7% miqdarında alınır. Göstərilmişdir ki, hər iki kompozit üçün komplekslərin miqdarı artdıqca onların elektrik möhkəmlikləri azalır və doyma halına yaxınlaşır.

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ПРОЧНОСТНЫЕ СВОЙСТВА КОМПОЗИТОВ НА ОСНОВЕ ПОЛИВИНИЛИДЕНФТОРИДА И КОМПЛЕКСОВ ЕВРОПИЙ

В работе исследованы механическая и электрическая прочности композитов на основе поливинилиденфторида (ПВДФ) и комплексов европий EuR_{29} и EuR_{34} . Установлено, что механическая прочность σ максимально увеличивается в случае композита ПВДФ+ EuR_{34} при содержании 5% EuR_{34} , а в случае композита ПВДФ+ EuR_{29} при содержании 7% EuR_{29} . Показано, что для обоих композитов с ростом содержания комплексов электрическая прочность уменьшается с дальнейшим приближением к насыщению.

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