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Review Article

INTERPOLYMERIC COMPLEX FOR PROTECTION OF THE BIOSPHERE AND SPARE WATER RESOURCES

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Abstract
The aim of the given work is prevention on wind and water erosion and an improvement of quality of ground, as well as increasing the efficiency of pouring water by using demoralized ecological harmless and economic available interpolymeric complexes (IPC). In last cheats significant successes in making a new class of modified polymeric material, which has allowed to mark new directions in the field of the physicist-chemistries of polymers. IPC are new broad class of polymeric combinations that find a practical application as desperation membranes, coverings, efficient, materials for medical purpose, medicine facilities, in the process of division of albumen and others. Known in the literature IPC on the base of synthetics corboconnection polymers an complementary stature have low level for using them in the agriculture, in consequence of their low biodistruetion and high cost. The rich possibilities presented IPC, can be marked in bid degrees in the process of high tonnage polymers, such as carboxymetilcellulose (CMC), of from the polymer of natural origin and that can come interaction urineformaldehyde resins (UFR). The main values of these products is connected with their low prices and accessibility and possibility of regulation a physicist chemical getting product characteristics. Obvious advantages of large sealed using specified IPC in the agriculture, for instance, for preventing a windy and water erosion of ground, as well as perfecting of its agrophysical characteristics. In the work develop fundamental approaches to making an efficient technology of getting and using the interpolymeric complex.

Keywords: Interpolymeric complex, biosphere, water resources.

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INTRODUCTION

Ecological catastrophe in the region of the Aral sea is significaly caused by salt and dust carrying to near territories with the population more than 3 million.

Ground of basin of the Aral sea particularly dry part of the territory bottom is subtracted erosion, in consequence of which not only the not available with growing of agriculture but as a result o windy erosion of these lifeless ground and salts on adjoining agricultural territory leads to essential worsening a structure of cultural ground and reducing their fertility.

This does necessary and urgent prevention of erosion of ground of dry bottom of the Aral sea by fastening its particles without the fixing of additional harm to environment.

Proposed works stipulate a decision of specified problem on the base of last achievements of science on polymers by structuring of ground basin of the Aral sea by interpolymerie complexes for preventing its windy and water erosion[1,2].

Interpolymerie complexes inside molecule simultaneously contain hydrofobe an hydrolife parts constituted of joined complementary chain areas and iongroups, formed by the separated areas opposite charged pollions.

Due to this characteristics IPC were successfully applying as structure forming of ground for preventing both water and windy erosion with simultaneous raising a fertility. In soil-polymeric root partials an dispersion phase are connected with each other by thin layers IPC. Such crusts are not destroyed under the influence strong winds and rain. IPC contributed on the surface of ground prevent its windy erosion within a time required for growing and development of grassy cover during the winds of hurricane power before 20-30 m/s. Along side with this IPC were broadly tasted by us also as facilities for preventing of washing out of ground [3,4].

Greatly that all these actions against erosion are ensured under highly small expenses of polymers (from 20 to 60 kg/h). Brightly denominated effect of stimulation of germination and developments of plants because of reducing an evaporation of water. Its fixed that IPC is nontoxic, ecological harmless.

Available experience of work with IPC for suppression of dust and salt carrying allows to come to conclusion about expedience of using for structuring ground not only for preventing polluting environment by low dispersion harmful materials.

MATERIALS AND METHODS

Technologies are designed by us for preparation and using IPC. IPC contribute sprinkling dissolves on the surface of ground or soil ensuring formation an even layer[5,6,9].

Formed gel IPC is capable to dry and be moistened without worsening aрезионных characteristics, i.e. qualities clamped layer.

Putting into ground an structurments will be formed by utter or interrupt defensive layer, which weaken influence of water an windy erosion and preserving surface of ground from destroying structure formed on ground and can bee successfully used al linking ground, soils and other dispersion systems[7,8].

In basin of Aral sea spot test of were held on the CMC and UFR based as linking substance. Surface of different ground of this region was processed by 3 % water solution such as complex under the total consumption of polymers of such complex 10 g/m2 (Table 1).

Table 1

№	Type of ground	Cultivate of ground by solution IPC	Waterproof of ground, containing factions of different dispersion,%		
			1 mm	1-0.25 mm	Summ of faction 0.25
1	From dry bottom of the Aral sea	Cultivated	6.3	28.1	34.4
2	From dry bottom of the Aral sea	Uncultivated	0.7	3.0	3.7
3	Sand from Cocdarya	Cultivated	50.1	25.0	75.1
4	Sand from Cocdarya	Uncultivated	0.7	18.7	19.4

There by, processing by 3 % water solution interpolyelectronic complex an суспензий and sand leads to increasing waterproof of these systems in 4-10 tomes, more over if dispersion of ground is high than effect of processing of polycomplex will be higher. Besides, during cultivation of ground by washing out decreases more than in 80 times, i.e. if washing out of ground of processed areas was 0,08 t/h than on the cheehed time it was 7,2 t/h.

That it is draw a conclusion on practicability of using the interpolymeric complexes as efficient facilities for the struggle with water and windy erosion the ground, in regions particularly, subject to intensive erosion to processes.

Lets examine the increase of complex. These qualities are connected with the structure of polymeric bodies possibility of their using. The given study represents independent scientific and practical value, as a structure of complex can be various changing construction UFR and CMC and an increasing of complex depends both from the structure of source components and the structure complex, in the significant degree define areas of possible their use in purpose spare pouring water. Ability of increasing IPC in water ambiences defines possibilities of their practical application as hydrogels (water-box) in ground. In these purpose examples IPC were explored by IPC composite of different structure ballooned increased unsalt water ambiences under pH=6.

A parameter z=CMC/CMC+UFR used for the feature of composition IPC CMC - UFR. Structure of IPC composite varied within 0.25-0.67. Under such structures composit is in water in the interval pH=5-8.

Cut-in in IPC of surplus amount CMC (z>0.5) brings about increase of the composite, while entering an excess UFR (z<0.5) is accompanied by reduction their increasing. In the event of the surplus contents CMC in hydrogel IPC increasing a value degree increasing is connected with presence of free carboxyl groups [1,2]. Chasing saline and hydrogen relationships bringing about reducing an amount unbound charged functional groups in CMC are formed that brings about reducing of increase of system.

Increasing that fact that UFR itself does not increase in water. Presence of IPC in surplus amounts, brings about some raising of increase of system.

In the arid regions of our country crop-capacity of the agricultural cultures depends, first of all on the supply by water. Rational using of the water resources has gained particular importance during the last years, when in these regions very tense position with provision of pouring water of the agricultural soul is packed. Currently water facility of region is practically completely exhausted.

One of the most perspective ways of economic use of pouring is an improvement of way of irrigating of the ground. Main way of irrigating of the agricultural in the arid gone-is area-shallow watering of which are a small cost and simplicity. However using shallow watering on ground with the increased waterdisproof (sandy and sandy loam) loss of watering water on the deep filtration can exceed 50% besides, intensive deep filtration of water brings about to uneven moistening during the use of watering on furrows.

That is why creation of resist-filtration screens, compositions by means of IPC for raising efficiency of use of pouring water and perfecting the conditions of development of agricultural cultures can be acceptable in the . circumstances of shallowness. Known ways of reducing a filtration of water with creation of resist-filtration screens with additives PAV and other organomineral materials are economic inadvisable and require moving the greater masses of ground, materials for making oppose; resist-filtration screen.

Melioration ways are known with use of resist-filtration screens from perforated polyethylene pipes, situated under the land at the depth near 50-55 refer to also little profitable. Because of specified defects none of known ways of creation of resist- filtration losses of water under pouring, did not find a broad practical application. We designed more simple way, based on the use of highly increased, new IPC composite, characterizing smaller labor content and energy intensity.

Highly sorption and increasing water. Possibility of regulation of mentioned features by changing a nature of components their correlation,densuty of charge in heavy, compatibility of source components and pH ambiences, open new possibilities of getting polycomplexly composition material with giros characteristics.

For making of resist-filtration screens it is necessary to use IPC composites, processing high increasity anc low penetration. High increasity corresponds the area z>0.5. Low value of toughness composite in this instance does not matter, since at the fixing dissolve will be formed soil-gel screen, which used for reducing he filtration.

Laboratory experiences of influence of screen from composite in abundaple CMC of filtration ground conduced by means of strainer by the diameter 24 refer to and special tray installation. Strainers and pallet were pilled in all experiences, Easy-coal ground with light remind and pouring water for getting a natural treedementional weight.

Comparison of filtration ability of different ground was realized by means of determinations of velocity of lowering a water level, kept above surface study ground. Also comparison speed of filtration were conducted. Results of study of speed of filtration “K” as well as time of filtration t in ground dilated in the table 2.

Table 2

Number orders	Quantity of water litter	Usual ground (control)		IPC composite brought about on the surface of the ground		IPC composite on the cerp of 40 S.	
		K	t,	K mm/min	t, s	K mm/min	t, s
1	1	88.4	12	51.00	26	94.70	11
2	1	60.3	15	31.57	42	69.70	19
3	1	55.2	22	13.95	61	29.40	45
4	1	33.1	40	8.89	95	21.90	63
5	1	30.1	44	4.60	140	12.70	104

From table 2 it is seen that creation of resist-filtration screen allows to shorten losses of water 2-3 on the deep filtration times and raise CUA using purity water.

Studies have installed that IPC of composition hydrogels, changing water-physical characteristics of ground, reduce water given in 4 times, enlarge a term of safety productive of water of 80%. Waterproof ability of hydrogels in several times enlarges water-safes in active layers of ground, with the result that increases a term of conservation of moisture of ground.

On the use IPC of composition hydrogel in purpose of studying spare water at pouring of cotton we conducted field studies on floors scholastic-experienced felicities but TEIIMA (Tashkent Engineers Institute of Irrigation and Mechanization of Agriculture).

Experienced area was chosen on three field, area 0.40 hec. Each with contributed IPC composer hydrogels in 1997-2000 y. Studies never held at the strategy UzEICI (Uzbek Education Institute of Chemical Institute) with the three-phase reapitness on two directions, as a study of influence of use IPC composers hydrogels on soil and mode of pouriny, as well as on phenology.

In ground of each experienced area with increasers, in the depth 0.2-0.4 m. In liquid or powdery condition in amount of 50kg/hec. hydrogels were contributed.

Operative determination of maisture of ground enable to define a term of watering, which were realized on the scheme 1-0-1 under -0.7-0.7-0.6 HB, active layer was under first and second pours accordingly to 0.6 and 0.7 m. Use of hydrogels enable to shorten an amount of watering on the experienced area before two watering on checking was three and four, in 1999 accordingly.

Irrigation rate in these has formed on the experienced are of 2650 m/hec. and 2470 m/hec, but on checking and 4150 m/hec.

DISCUSSION

For studying an influence of soil water in ensuring the plants of water observant bore holes were installed on experienced and checking areas. As a result staking out water table (SWT) installed that depth on 1.5-1.8 m. in water supply of cotton significant dug do not play participant in the accumulation of water with hydrogel. Different nature area in increases IPC capable with the high velocity be changed by places with each other. These particularities of structure IPC reports it unique possibility absorved on surface of different nature and be adapted to changing external environment in the area of contact.

Direct its influence studies on plants have shown that IPC hydrogel promotes a best proving and elevated, and root part of agricultural cultures. Highly it is important and that get does not suppress микрофлору of ground and is not destroyed by bacteria's. At presence in ground hydrogel with the spare of water possible greatly scribble water stress plants. In ground, mixed with IPC by hydrogel, through 20 even 40 a level of its normal moisture possible to support, having or number of wateriness, or their intensity.

Decidings the ecological problems we also received interpolymerie composition material with dispersion fillers. Practically attractive using for these whole departures large earned one's living production. So, for instance, as a departure of Almalyk chemical plant.

Leading total foregoing possible to do a following conclusion:

-qualitative and qualitative evaluation of stability soils to water-windy erosion at the fixing dissolve CMC - UFR has shown a formation on surface of denuding bottom of the Aral sea firm defensive polymeric-soil crust. Installed optimum correlation of components reception (CM C+U FR=1:1) and rates of consumption;

-studies of efficiency of IPC for dust-collection and localization an radionuclears that interpolymeric complex on the base carbonsilm etilcelluloze in not feeling mechanical influence. Using of IPC allows of the average in 20 once reduce a carrying the redioactive materials at velocities of flow of air before 10 m/sec. Mechanical toughness created defensive polymeric-soil crust layer at the consumption by 3 % dissolve 0.75 1/m leaves at the average 3.5 kg/cm 2, but at the consumption 1.5 1/m2 increase 5 kg/sm^2.

CONCLUSION

Installed that developed interpolymeric compositions material in abundance of carbonsilmetilcelluloze can be used as highly-increasable hydrogels an a resist-filtration screen, that in abundance urineformaldehydrorisen and dispersion filters in spare irrigation water (get on even sharing water on the length by watering furrows) that allows to raise crop capacity of agricultural ground.

Thereby, reception of interpolymeric complexes on the base of carbonsil metilcelluloze and am inocontains polymers with beforehand given characteristics enable making the perspective material depending on further their using for concrete problems.

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