

DEVELOPMENT OF TECHNOLOGY FOR OBTAINING NPK LIQUID CHELATE FERTILIZERS CONTAINING MICROELEMENTS

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Abstract : *This in the article in the composition microelements was NPK based on liquid chelate the boys to take technology working exit issues illuminated. Modern village on the farm liquid complicated from boys use promising direction is considered , because they food elements high in concentration keeps , one flat distributed and plants by easy Research during SEM - EDS in the way taken analysis results based on of the sample element The composition (C , O , Na , Al , Si , Cl , Fe , Pt) was determined . Obtained information chelate son of a bitch in the content macro - and microelements ratio assessment opportunity gave. Offer being done technology orthophosphate acid, potassium hydroxide, urea and EDTA chelating agent tool using microelements salts to dissolve based to be, this method high biological to efficiency has stable liquid boy to take opportunity gives.*

Key words: *liquid fertilizers, chelate compounds, NPK, microelements, SEM-EDS, technology, EDTA.*

INTRODUCTION

Intensive village on the farm plants complete and balanced feeding problem current become remains. Traditional solid mineral fertilizers with one in a row, liquid complex from fertilizers use efficiency their advantages with explained: preparation technology simplicity , ease of

use one plain , labor of fertility increase and transportation costs decrease . Next in years chelated micronutrients plants by acquisition traditional salt to the forms relatively much high that many in research approved . Chelating substances (EDTA, DTPA and others) metal ions stable organic to complexes turning them solubility and plants by absorption increases .

Liquid to the children to be placed main from the requirements one of them storage and application in the process of salts crystallization low temperature , as well as the content all food elements far time during stable in case This is the preservation of of the research purpose – in the structure NPK -based fertilizers with microelements (especially iron) liquid chelate fertilizer to take technology working exit and its elemental composition was determined by SEM-EDS method using from learning consists of .

MATERIALS AND RESEARCH METHODS

In the study liquid chelate fertilizer to take for raw material as extraction orthophosphate acid (H_3PO_4), potassium hydroxide (KOH), urea ($\text{CO}(\text{NH}_2)_2$), iron (Fe) and other microelements salts and as a chelating agent ethylenediaminetetraacetic acid acid disodium salt (EDTA-Na_2) was used . Chelation process in the range of $\text{pH}=5.0\text{--}6.5$ and at a temperature of $50\text{--}60^\circ\text{C}$ take went .

Prepared liquid fertilizer elemental composition of the sample determination for scanner electronic microscopy and energy-dispersive X-ray spectroscopy (SEM-EDS) method This method was used . sample of elements mass and atomic percentages high in accuracy determination opportunity gives . Fertilizer sample in advance dried , special to the substrate glued and electronic light with irradiated .

RESULTS AND DISCUSSION

SEM-EDS analysis The results are presented in Table 1 .

Table 1: Liquid chelate Elemental composition of fertilizer

Element	Mass %	Atomic %
C	37.83 ± 0.08	50.91 ± 0.10
Oh	38.84 ± 0.11	39.24 ± 0.12
No	6.76 ± 0.04	4.75 ± 0.03
Hand	0.21 ± 0.01	0.12 ± 0.00
Yes	0.06 ± 0.00	0.04 ± 0.00
Cl	3.13 ± 0.02	1.43 ± 0.01
Fe	11.71 ± 0.06	3.39 ± 0.02
Pt	1.46 ± 0.02	0.12 ± 0.00

Analysis to the results see , fertilizer in the composition carbon (C) and oxygen (O) high in quantity (appropriate) respectively 37.83% and 38.84% mass according to) record This is urea . and organic chelate complexes existence with It is explained that 6.76% of sodium (Na) to be , used chelating agent (EDTA- Na_2) sodium ion with depends .

Iron (Fe) high amount (11.71% mass) (according to) the fertilizer with iron chelate in the form of enriched Chelated iron plants by easy will be mastered and chlorosis to the disease against effective tool as service . Chlorine (Cl) in the amount of 3.13% existence, raw material in the content chlorides remainder or technological process during enter remaining pollutant as evaluation Aluminum (Al) and silicon (Si) micro in quantity (appropriate) respectively 0.21 % and 0.06 %) elementary raw material from the composition arrived mixtures that shows . Determination of platinum (Pt) (1.46% mass) according to) this element

is fertilizer to the composition technological additional as not included because , perhaps , analysis in the process sample preparation with related to be SEM-EDS method can be used to determine the NPK and zeolite fertilizers the composition also used in learning is , this method food elements spread features in determining effective that proven .

Received results this shows that the proposal done technology based on prepared liquid fertilizer in the composition macroelements (C, O, Na) and important micronutrient – iron (Fe) chelate in the form of available . Chelating tool Using EDTA -Na₂ as a metal ions in solution stable without save them to sink to fall prevent to take and plants by absorption increase opportunity EDTA - based chelates in the pH range of 4-6.5 the most stable This is the case . fertilizer wide kind of in soils and various irrigation Application in irrigation systems (drip , spray) opportunity creates .

CONCLUSION

Transferred research as a result in the composition microelements NPK - based liquid chelate fertilizer to take technology working Technology orthophosphate acid, potassium hydroxide , urea and with EDTA chelated iron salts in the water to dissolve based on the SEM-EDS method elemental analysis performed fertilizer in the composition macro - (C, O, Na) and the presence of microelements (Fe, Cl) Iron chelate 11.71% mass in the form of in the amount of to be Fertilizer for iron deficiency against effective that confirms .

Offer being done of technology advantages : preparation process simplicity , chelated micronutrients high biological existence and solution storage during stability . This liquid fertilizer leaf through and root from below in feeding application possible . In the future working

issued of fertilizer various village farm to crops in use agronomic efficiency in the field study to the goal is appropriate .

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