Modified humic acid degradation product, preparation method and composition patch thereof

Abstract

The invention discloses a modified humic acid degradation product, a preparation method and a composition patch thereof. The preparation method comprises the following steps: (1) pulverizing the raw material of humic acid, and adding microorganisms to carry out biodegradation, thereby obtaining the humic acid degradation product; (2) in water or organic solvent, under the action of catalyzer, carrying out reaction between boric acid and hydroxyl amine to form hydramine borate; (3) in water or organic solvent, carrying out ester exchange between hydroxyl amine and glycol to form organoboron; and (4) in water, carrying out reaction between the humic acid degradation product obtained in step (1) and the organoboron obtained in step (3) to form an organoboron modified humic acid degradation product. The modified humic acid degradation product can be made into a patch which is applied to the dantian of a patient with Type 2 diabetes; when the patient have meals, the modified humic acid degradation product can stimulate the secretion of insulin, promote the insulin to quickly secrete after meals, and enables the insulin between two meals to be independently regulated to the foundation level; and the regulating range of the blood sugar index reaches +/-20%. The invention has the advantages of high safety factor and favorable social and economic benefits.

CN101708188A

China

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Other languages: Chinese

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Current Assignee : East China University of Science and Technology

Worldwide applications

2009 ~~CN~~

Application CN200910201395A events

2009-12-18	Application filed by East China University of Science and Technology
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2010-05-19	Publication of CN101708188A
2012-07-04	Application granted
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Status	Expired - Fee Related
2029-12-18	Anticipated expiration

Info: Cited by (4), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (10)

Hide Dependent

1. the preparation method of the humic acid degradation product of a modification is characterized in that, may further comprise the steps:

1) adds the microorganism biodegrade in the humic acid material that will pulverize, get humic acid degradation product;

2) in water or organic solvent, under the effect of catalyst, boric acid and hydroxyl hydramine react, and form the boric acid alkanolamine ester;

3) in water or organic solvent, boric acid alkanolamine ester and glycol carry out ester exchange, form organic boron;

4) in water, organic boron of the humic acid degradation product of step 1) gained and step 3) gained reacts, and forms the humic acid degradation product of organic boron modification.

2. preparation method as claimed in claim 1 is characterized in that, the described bio-degradation reactions of step 1) is carried out in aqueous medium.

3. preparation method as claimed in claim 1 is characterized in that step 2) described hydroxyl hydramine is monoethanolamine or diethanolamine.

4. preparation method as claimed in claim 1 is characterized in that step 2) described catalyst is quaternary amine $(CH_3)_3N^+Cl^-CH_2COOCH_2CH_3$

5. preparation method as claimed in claim 1, it is characterized in that, the described humic acid material of step 1) is a natural peat, brown coal, weathered coal or their mixture, the described microorganism of step 1) is selected from yeast, penicillium, gibberella, whiterot fungi or their mixture, the temperature of the described bio-degradation reactions of step 1) is 5 ℃ ~ 75 ℃, the time of reaction is 72 ~ 216 hours, the molecular weight of the described humic acid degradation product of step 1) is 150 ~ 5000, step 2) described organic solvent is selected from ethanol and ethanolamine, step 2) temperature of described reaction is 50 ~ 170 ℃, the described organic solvent of step 3) is selected from ethanol and ethanolamine, the temperature of the described reaction of step 3) is 30 ~ 120 ℃, and the temperature of the described reaction of step 4) is 5 ~ 85 ℃.

6. the humic acid degradation product of the organic boron modification for preparing as each described preparation method of claim 1 ~ 5 and get.

7. the pharmaceutical composition of forming by the humic acid degradation product and the pharmaceutical carrier of organic boron modification as claimed in claim 6.

8. pharmaceutical composition as claimed in claim 7, it is characterized in that, the content of the humic acid degradation product of described organic boron modification is preferred 4 ~ 50%, and described pharmaceutical carrier is selected from Rhizoma amorphophalli, Folium Camelliae sinensis, Rhizoma Dioscoreae powder, pollen, modified polyvinyl alcohol adhesive or their mixture.

9. pharmaceutical composition as claimed in claim 8 is characterized in that described pharmaceutical composition is a plaster.

10. the application in the medicine of preparation prevention or treatment impaired glucose tolerance or diabetes of the humic acid degradation product of organic boron modification as claimed in claim 7 or compositions as claimed in claim 8.

Description

Humic acid degradation product of a kind of modification and preparation method thereof and composition patch

Technical field

The invention belongs to chemical field, particularly humic acid degradation product of a kind of modification and preparation method thereof and compositions.

Background technology

Impaired glucose tolerance disease and diabetes are metabolic diseases of a kind of multi-pathogenesis, and characteristics are chronic hyperglycemia, are accompanied by insulin causes with absolute the shortage relatively in the blood flow sugar, fat and protein metabolism disorder.For insulin-dependent (I type) diabetes patient, need long-term subcutaneous injection insulin, make that the toleration of treatment is very poor.For non-insulin-depending type (II type) diabetes patient, may concurrent nephropathy if effectively do not cure, heart disease, ophthalmic etc.According to latest survey in 2009 of Chinese Medical Association, Chinese diabetics number reaches 9,240 ten thousand people, has accounted for 9.7% of city adult's sum.And showing that according to the prediction of World Health Organization (WHO) Chinese diabetes chronic diseases also is in the zooming initial stage, the treating diabetes strategy of setting up to put prevention first is crucial.

Non-insulin-depending type (II type) diabetes Western medicine antidiabetic drug is had " sulphur urea " class and " biguanide " class usually, and its medical mechanism is obvious, but side effect such as hypoglycemia can take place.Seeking high-efficiency low-toxicity, the clear and definite medicine of hypoglycemic mechanism from Chinese medicine is one of emphasis of exploitation diabetes medicament.Patent application 200810238225.5 discloses a kind of Chinese medicine preparation of blood sugar regulation, and complication such as the cardiovascular and cerebrovascular vessel that diabetes are caused, kidney, cataract has the certain protection effect.The pancreas Kangfu capsule that patent 200410075715.X makes, blood sugar lowering stype etc., its main component is Chinese medicines such as bitter gourd core, LIZIHE, Ramulus Mori, is used for the adjusting of microcirculation.Patent application CN1415318 utilizes the supercritical extraction technology to extract " Fructus Schisandrae Chinensis ", development " sugar gram ", and pharmacological action is " Fructus Schisandrae Chinensis ".But these diabetes medicaments far can not reach the effect of high-efficiency low-toxicity.

Summary of the invention

Therefore, the technical problem to be solved in the present invention is exactly that, side effect low at the diabetes medicament drug effect is big, the deficiency of poor stability, the medicine and preparation method thereof and the intermediate of a kind of treatment or prevent diabetes are provided, and this medicine is with low cost, safety good, do not produce drug resistance.

The present invention solves the problems of the technologies described above one of technical scheme of being adopted: a kind of preparation method of humic acid degradation product of modification may further comprise the steps:

1) adds the microorganism biodegrade in the humic acid material that will pulverize, get humic acid degradation product;

2) in water or organic solvent, under the effect of catalyst, boric acid and hydroxyl hydramine react, and form the boric acid alkanolamine ester;

3) in water or organic solvent, boric acid alkanolamine ester and glycol carry out ester exchange, form organic boron;

4) in water, organic boron of the humic acid degradation product of step 1) gained and step 3) gained reacts, and forms the humic acid degradation product of organic boron modification.

Among the present invention, add the microorganism biodegrade in the humic acid material that step 1) will be pulverized, get humic acid degradation product.Wherein, preferably natural peat, brown coal, weathered coal or their mixture of described humic acid material.Natural peat preferable as Yunnan stone screen natural peat, its humic acids content is higher.That the particle diameter that described humic acid material is pulverized is preferable is 20 ~ 100nm, and that better is 20 ~ 50nm.The method of pulverizing can adopt the conventional breaking method in this area, and preferable for to pulverize in the ultrahigh speed pulverizer, that the linear speed of ultrahigh speed pulverizer is preferable is 100 ~ 250m/s, and that better is 150 ~ 200m/s.Pulverize preferable carrying out under 30 ~ 80 ℃, better carries out under 50 ~ 60 ℃.To use behind described humic acid material or the air-dry removal moisture of humic acids, effect is better.Air-dryly adopt natural air drying or artificial drying, preferable condition is: under 15 ~ 35 ℃ temperature, through 5 ~ 10 days natural air dryings, perhaps in thermostatic drying chamber, under 50 ~ 75 ℃ the temperature, through oven dry in 1 ~ 3 hour, under 60 ~ 70 ℃ the temperature that better is, through oven dry in 2 hours.Described microorganism is Mycophyta preferably, preferable yeast, penicillium, gibberella, whiterot fungi or their mixture of being selected from, better yeast, penicillium and the whiterot fungi of being selected from.What the mass ratio of microorganism and humic acid material reaction was preferable is 1: 1000 ~ 1: 20000, and better is 1: 3000 ~ 1: 8000.This bio-degradation reactions is carried out in aqueous medium, the weight ratio of the water yield and humic acid material preferably 0.1: 1 ~ 1: 1.Preferred 5 ℃ ~ 75 ℃ of the temperature of bio-degradation reactions.Preferably 72 ~ 216 hours response time.This moment, palliating degradation degree was moderate, can obtain being fit to the humic acid degradation product of molecular weight.Humic acid degradation product mainly comprises yellow humic acid and hymatomalenic acid.

After biodegradation finished, the humic acid degradation product of gained can directly carry out the next step, also can get liquid phase and carry out next step reaction through solid-liquid separation.Main component in the liquid phase is yellow humic acid, hymatomalenic acid.The present invention selects the molecular weight of yellow humic acid, hymatomalenic acid to be advisable 150 ~ 5000, with 300 ~ 1000 better, carries out next step reaction.

Among the present invention, step 2) be: in water or organic solvent, under the effect of catalyst, boric acid and hydroxyl hydramine react, and form the boric acid alkanolamine ester.Wherein, preferably monoethanolamine or diethanolamine of described hydroxyl hydramine.The consumption of hydroxyl hydramine is 0.5: 1 ~ 5: 1 with the mole ratio of boric acid preferably, more preferably 1: 1.Described catalyst is selected from quaternary amine, preferable ethyl, propyl group, butyl trimethyl quaternary amine, the more preferably (CH of being selected from $_3$) $_3$N $^+$Cl $^-$CH $_2$COOCH $_2$CH $_3$Catalyst amount is 0.001: 1 ~ 0.01: 1 with the weight ratio of reactant preferably.Reaction dissolvent is preferable is selected from water, ethanol and the ethanolamine one or more.The consumption of reaction dissolvent is 0.05: 1 ~ 0.50: 1 with the weight ratio of reactant preferably.Preferably 50 ~ 170 ℃ of reaction temperatures, best is 90 ℃.Preferably 2 ~ 3 hours response time.The boric acid alkanolamine ester of gained is the boric acid alkanolamine ester of equimolar amounts preferably.The boric acid alkanolamine ester of gained is directly used in next step reaction.

Among the present invention, step 3) is: in water or organic solvent, boric acid alkanolamine ester and glycol carry out ester exchange, form organic boron intermediate.Wherein, described glycol (being ethylene glycol) and boric acid mass ratio are preferably 0.01: 1 ~ 20: 1.Reaction dissolvent is preferable is selected from water, ethanol and ethanolamine, and best is water.The consumption of reaction dissolvent preferable with volume ratio glycol 0.1: 1 ~ 1: 19.Preferably 30 ~ 120 ℃ of reaction temperatures.Preferably 2 ~ 25 hours response time.The organic boron that forms is stable chemical compound, can be used for next step reaction after the separation and purification.

Among the present invention, step 4) is: in water, organic boron of the humic acid degradation product of step 1) gained and step 3) gained reacts, and forms the humic acid degradation product of organic boron modification.Wherein, the consumption of organic boron is 1: 200 ~ 1: 1000 with the mass ratio of humic acid degradation

product preferably.The reaction dissolvent preferred water, reaction dissolvent consumption volume ratio 0.1: 0.5 ~ 1: 10.Preferably 5 ~ 85 ℃ of reaction temperatures, best is 65 ℃.Preferably 1 ~ 3 hour response time.

Among the present invention, the humic acid degradation product of organic boron modification of gained is the raw material of preparation diabetes medicament, introduces drug-loading system as sugared concentration-response-coordination compound.The humic acid degradation product of described organic boron modification can also can get solid through separation and purification, as the raw material of preparation treatment or prevention impaired glucose tolerance or diabetes medicament directly as the raw material of preparation diabetes medicament.Preferable, the humic acid degradation product of described organic boron modification and pharmaceutical carrier are formed pharmaceutical composition.The content of the humic acid degradation product of described organic boron modification in said composition is preferred 0.01 ~ 99.9%, and preferably 40 ~ 50%, percentage ratio is mass percent.Described pharmaceutical carrier is preferable is selected from Rhizoma amorphophalli powder, Folium Camelliae sinensis powder, Rhizoma Dioscoreae powder, pollen, binding agent commonly used pharmaceutically, as modified polyvinylalcohol (PVA) binding agent etc. or their mixture.This pharmaceutical composition can be further used for preparing plaster, can be by conventional plaster preparation method preparation.Described plaster is regulated insulin release by Transdermal absorption, acupuncture point effect.The sugared CI scope of its adjusting is 3.2 ~ 10.5, and is preferred 5.5 ~ 7.5, and regulation rate is ± 25%.

Phenylboric acid (phenylboronic acid) and derivant thereof and polyols such as polysaccharide, glycolipid, glycoprotein and nucleotide have can be converse, and this character is usually used in carrying out identification, separation, the detection of glucide.Humic acids has functional groups such as carboxyl, hydroxyl, methoxyl group, belongs to biomacromolecule.Therefore, the humic acid degradation product of organic boron modification of the present invention also can form coordination compound with sugar, as the monomer of sugared concentration-response.Its pharmacology mechanism is as follows:

Wherein, R1 is an insulin; R2 is a humic acid degradation product; Polyol represents sugar.

When sugared concentration is high, sugar (Polyol) and humic acids (R_2)-boron forms ligand, makes glycosylated insulin (R1) quantitative change that comes off big;

When sugar concentration was low, glycosylated insulin (R1) quantitative change that comes off was little, does not perhaps come off.Burst size self-discipline formula to insulin of the present invention is regulated medicine, has both promoted the synthetic and decomposition of normal glycogen, prevents hypoglycemic generation again.

Raw material that the present invention is used or reagent except that specifying, all commercially available getting.

Than prior art, beneficial effect of the present invention is as follows: the humic acid degradation product of organic boron modification of the present invention, the plaster of simulation physiological insulin secretion has stimulation to insulin secretion at table, impels after the meal insulin to secrete fast.Make int cib insulin self-discipline formula be adjusted to foundation level, and, continue to stimulate the release of whole day insulin unlike " sulphur urea " class medicine.Its safety coefficient height, social, good in economic efficiency.The self-discipline formula blood glucose plaster of this preferred humic acid degradation product modification, by Transdermal absorption, acupuncture point effect etc. to the induced organic boron of blood glucose-humic-acid kind Chinese medicine and western medicine medicine for external use, pharmacological action is clear and definite, potential application prospect and good economy performance can be used for setting up with the impaired glucose tolerance disease of putting prevention first, the scheme for the treatment of diabetes.

Description of drawings

Below in conjunction with description of drawings feature of the present invention and beneficial effect.

Fig. 1 is organic boron infrared spectrum analysis figure.

Fig. 2 is organic boron modified natural humic acid degradation product infrared spectrum analysis figure.

The specific embodiment

Further specify the present invention with embodiment below, but the present invention is not limited.The experimental technique of unreceipted actual conditions in the following example, usually according to normal condition, or the condition of advising according to manufacturer.Described " room temperature " is meant the natural temperature between experimental implementation, is generally 25 ℃.

The preparation of embodiment 1 natural humic acid degradation product

Is the Yunnan stone screen natural peat of 59% (Wt) with 1000g through the humic acids content of natural air drying, in the ultrahigh speed pulverizer of on-line velocity 200m/s, is ground into the microgranule of 20nm.Add 0.3mg penicillium (300IU), whiterot fungi (1500IU), add entry 100ml.Room temperature is reaction 216hr down, and biodegradation makes the humic acid in peat degradation product.The centrifugal solid-liquid separation of carrying out is got liquid.The molecular weight that detects humic acid degradation product with cryoscopic method and high performance capillary electrophoresis is 330.

Synthesizing of embodiment 2 organic boron intermediate

Get 1800g boric acid, 150g diethanolamine, 0.5g quaternary amine [$(CH_3)_3N^+Cl^-CH_2COOCH_2CH_3$], add 10g water, at 90 ℃ of reaction 3hr, form the boric acid ethanolamine ester of equimolar amounts.The glycol aqueous solution that adds 100mL 50% (wt) again reacts 25hr down for 30 ℃ in temperature, gets the organic boron of product.The infrared spectrum analysis figure of this product sees Fig. 1.

Organic boron modification of embodiment 3 natural humic acid degradation products

Get natural humic acid degradation product liquid and 100ml embodiment 2 gained product that 100ml embodiment 1 makes, reacted 3 hours down at 85 ℃.Behind the filtration of product process, the Rotary Evaporators drying and dehydrating, get white crystal.This crystalline infrared spectrum analysis figure sees Fig. 2, and as seen it is exactly a natural humic acid degradation product of finishing organic boron modification.

The preparation of embodiment 4 blood glucose regulation plaster

Get the natural humic acid degradation product 50g of organic boron modification of embodiment 3 gained, with Rhizoma amorphophalli powder 30g, tea dust 15g, modified polyvinylalcohol (PVA) binding agent 5g, in 30 ℃ of following uniform mixing, from microwave disinfection 1.5min, cooling, make 100g viscosity shape product, behind the microwave sterilizating 1.min of carrying vapour function, on absorbent gauze, put into 10g glycerol again, the attached water proof medical adhesive plaster that sticks, make diameter 50mm, the plaster of the about 3mm of thickness.

Embodiment 5

Get the natural humic acid degradation product 20g of organic boron modification of gained, add Rhizoma Dioscoreae powder 22g, pollen 5g, modified polyvinylalcohol (PVA) binding agent 3g, in 42 ℃ of following uniform mixing, from microwave disinfection 1.5min, cooling, make the microviscosity product that 50g has the blood glucose regulation function, behind microwave sterilizating 0.5min, on absorbent gauze, put into 5g glycerol again, the attached water proof medical adhesive plaster that sticks, make diameter 30mm, the plaster of the about 2mm of thickness.

Embodiment 6

1, the preparation of natural humic acid degradation product

To in the ultrahigh speed pulverizer of on-line velocity 250m/s, be ground into the microgranule of 50nm through 30 ℃ of air-dry 500g brown coal and 500g weathered coal.Add 1g penicillium (300IU), yeast (1500IU), gibberella (300IU), add entry 1000ml.75 ℃ of reaction 120hr, biodegradation makes the humic acid in peat degradation product.The centrifugal solid-liquid separation of carrying out is got liquid.The molecular weight that detects humic acid degradation product with cryoscopic method and high performance capillary electrophoresis is 150.

2, organic boron intermediate is synthetic

Get 180g boric acid, 150g ethanolamine, 0.5g quaternary amine [$(CH_3)_3N^+Cl^-CH_2COOCH_2CH_3$], add 10g ethanol, at 50 ℃ of reaction 3hr, form the boric acid ethanolamine ester of equimolar amounts.The glycol aqueous solution that adds 500mL 50% (wt) again reacts 2hr down for 120 ℃ in temperature, gets the organic boron of product.

3, organic boron modification of natural humic acid degradation product

Get natural humic acid degradation product liquid and 100ml step 2 gained product that 10ml step 1 is made, reacted 3 hours down at 5 ℃.Behind the filtration of product process, the Rotary Evaporators drying and dehydrating, getting white crystal is the natural humic acid degradation product of organic boron modification.

4, according to prescription and the method for embodiment 4, the plaster that the natural humic acid degradation product of organic boron modification of gained is made.

Embodiment 7

1, the preparation of natural humic acid degradation product

To in the ultrahigh speed pulverizer of on-line velocity 100m/s, be ground into the microgranule of 100nm through 80 ℃ of air-dry 1000g weathered coals.Add 50mg yeast (300IU), gibberella (1500IU), add entry 500ml.5 ℃ of reaction 72hr, biodegradation makes the humic acid in peat degradation product.The centrifugal solid-liquid separation of carrying out is got liquid.The molecular weight that detects humic acid degradation product with cryoscopic method and high performance capillary electrophoresis is 5000.

2, organic boron intermediate is synthetic

Get 180g boric acid, 150g ethanolamine, 1.8g quaternary amine [$(CH_3)_3N^+Cl^-CH_2COOCH_2CH_3$], add 10g water and 80g ethanolamine, at 170 ℃ of reaction 2hr, form the boric acid ethanolamine ester of equimolar amounts.The glycol aqueous solution that adds 1000mL 50% (wt) again reacts 12hr down for 50 ℃ in temperature, gets the organic boron of product.

3, organic boron modification of natural humic acid degradation product

Get natural humic acid degradation product liquid and 10ml step 2 gained product that 100ml step 1 is made, reacted 1 hour down at 65 ℃.Behind the filtration of product process, the Rotary Evaporators drying and dehydrating, getting white crystal is the natural humic acid degradation product of organic boron modification.

4, according to prescription and the method for embodiment 4, the plaster that the natural humic acid degradation product of organic boron modification of gained is made.

Further specify beneficial effect of the present invention below by effect embodiment.

Effect embodiment 1

Get embodiment 4,5, the plaster of 6,7 preparations spreads on patient " public region " position through being diagnosed as type ii diabetes respectively when having lunch, and once a day, one time one card continued for 1 week.By 2 hours after the meal, through OMRON/HEA-214 type blood glucose meter detect natural humic acid blood glucose regulation plaster use before and after sugared CI, the results are shown in Table 1, visible glycemic index range of accommodation reaches ± 20%.

Plaster	Number of users	Average blood sugar CI before using	Make medication card average blood sugar CI after the meal	The glycemic index range of accommodation
Embodiment 4	??10	??3.9	??5.0	??-18.5
Embodiment 6	??10	??4.5	??5.0	??-16.4

Embodiment 5	?? 10	?? 6.3	?? 5.1	?? +20.0
Embodiment 7	?? 10	?? 6.9	?? 5.2	?? +25.2

Cited By (4)

Publication number	Priority date	Publication date	Assignee	Title
CN102242152A *	2011-05-10	2011-11-16	华东理工大学	Humic acid active component, preparation method and application thereof, and pharmaceutical composition containing same
CN103588977A *	2013-11-08	2014-02-19	云南联合药业有限责任公司	Method for extracting and preparing peat fulvic acid and drug application
CN104140789A *	2013-07-26	2014-11-12	中国石油化工股份有限公司	High temperature resistant fluid loss additive for oil-based drilling fluid and preparation method thereof
CN104906138A *	2014-03-11	2015-09-16	莫珉	Physiologic equilibrium drug liquid for treating diabetes and complications thereof
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN101708188B	2012-07-04	Modified humic acid degradation product, preparation method and composition patch thereof

CN101693730B	2012-07-18	Mangiferin and preparation method and application thereof
CN101904882A	2010-12-08	Preparation method of lithocarpus litseifolius total flavone
KR101538450B1	2015-07-22	Arctigenin-containing bardanae fructus extract and method for producing same
KR102185474B1	2020-12-03	Extracts effective in treating drug addiction and preparation method thereof
CN104906199B	2018-12-04	A kind of buckwheat shell flavone extract and the purposes as DPP4 inhibitor
CN101843310A	2010-09-29	Jiantangcha (blood glucose benefiting tea) capsule for adjunctively reducing blood glucose and improving symptoms of diabetes and preparation method thereof
CN111700927B	2021-07-30	Medicinal and edible composition with blood sugar reducing effect and preparation method and application thereof
CN101444599B	2012-09-19	Corn silk extract and preparation method thereof and application thereof in preparing drugs for treating gout
CN101647794B	2012-09-19	Diffractive ring mangiferin in mango leaf and new application of mango leaf extract containing diffractive ring mangiferin
CN101224246B	2011-06-29	Preparing method of loquat leaf total triterpenic acid and antidiabetic use thereof
CN102432602A	2012-05-02	Mangiferin hepta-propyl-esterified derivative
CN102228513A	2011-11-02	Medicinal composition for treating diabetes or diabetic complications and preparation method thereof
CN103848918A	2014-06-11	Extraction method for astragalus polysaccharide
CN107213176B	2020-07-28	Hydrangea macrophylla leaf extract, and pharmaceutical composition, preparation method and application thereof
CN101104013A	2008-01-16	Preparation of traditional Chinese medicine active component for treating diabetes and application thereof
CN105455120A	2016-04-06	Golden camellia tea assisted blood sugar lowering capsule
CN100382813C	2008-04-23	Pressure lowering maijunan capsule and its preparation method
CN105079174B	2018-09-11	A kind of tonic tablet for kidney-reinforcing and preparation method thereof
CN101744803B	2011-05-25	Method for preparing oridonin solid dispersion
CN101366731B	2012-11-28	Propolis flavone, preparation method and uses in treating diabetes
CN102432603A	2012-05-02	Preparation method and pharmacological effect of mangiferin hexa-butyl-esterified derivative
CN102125574B	2013-03-20	Medicinal composition for suppressing tumors
CN101756955A	2010-06-30	Chinonin complex, preparation method and application thereof
CN109350746B	2021-07-23	Preparation method of 1-deoxynojirimycin sustained release preparation with mulberry leaf polysaccharide as carrier

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN2009102013950A	2009-12-18	2009-12-18	Modified humic acid degradation product, preparation method and composition patch thereof

Applications Claiming Priority (1)

Application	Filing date	Title
CN2009102013950A	2009-12-18	Modified humic acid degradation product, preparation method and composition patch thereof

Legal Events

Date	Code	Title	Description
2010-05-19	C06	Publication	
2010-05-19	PB01	Publication	
2010-07-07	C10	Entry into substantive examination	
2010-07-07	SE01	Entry into force of request for substantive examination	
2012-07-04	C14	Grant of patent or utility model	
2012-07-04	GR01	Patent grant	
2016-02-10	CF01	Termination of patent right due to non-payment of annual fee	**Granted publication date**: 20120704

Termination date: 20141218

2016-02-10	EXPY	Termination of patent right or utility model

Concepts

machine-extracted

Download Filter table

Name	Image	Sections	Count	Query match
humic acid		title,claims,abstract,description	80	0.000
degradation product		title,claims,abstract,description	60	0.000
preparation method		title,claims,abstract,description	25	0.000
mixture		title,claims,abstract,description	12	0.000
chemical reaction		claims,abstract,description	26	0.000
water		claims,abstract,description	21	0.000
Boric acid		claims,abstract,description	18	0.000
boric acid		claims,abstract,description	18	0.000
glycol		claims,abstract,description	11	0.000
organic solvent		claims,abstract,description	10	0.000
biodegradation reaction		claims,abstract,description	9	0.000
microbiome		claims,abstract,description	7	0.000
boron		claims,description	40	0.000
boron		claims,description	40	0.000
modification		claims,description	26	0.000
modification reaction		claims,description	26	0.000
drug		claims,description	20	0.000
Diabetes mellitus		claims,description	18	0.000
plaster		claims,description	16	0.000
effects		claims,description	13	0.000
esters		claims,description	12	0.000
hydroxyl hydramine		claims,description	12	0.000
ethanol		claims,description	10	0.000
ethanolamine		claims,description	9	0.000
material		claims,description	9	0.000
peat		claims,description	8	0.000
amines		claims,description	6	0.000
catalyst		claims,description	6	0.000
pharmaceutical composition		claims,description	6	0.000
powder		claims,description	6	0.000
Penicillium		claims,description	5	0.000
Saccharomyces cerevisiae		claims,description	5	0.000
Fungi		claims,description	4	0.000
Fusarium		claims,description	4	0.000
Glucose Intolerance		claims,description	4	0.000
drug carrier		claims,description	4	0.000
polyvinyl alcohol		claims,description	4	0.000

prevention	claims,description	4	0.000
Diethanolamine	claims,description	3	0.000
adhesive	claims,description	3	0.000
adhesive	claims,description	3	0.000
carbon	claims,description	3	0.000
coal	claims,description	3	0.000
lignite	claims,description	3	0.000
Polyvinyl alcohol	claims	1	0.000
insulin	abstract,description	24	0.000
Blood	abstract,description	11	0.000
Insulin	abstract,description	11	0.000
Insulin	abstract,description	11	0.000
blood	abstract,description	11	0.000
meals	abstract,description	6	0.000
raw material	abstract,description	5	0.000
regulatory	abstract,description	4	0.000
pulverizing process	abstract,description	2	0.000
hydroxylamine	abstract	2	0.000
Diphenhydramine	abstract	1	0.000
Type 2 Diabetes Mellitus	abstract	1	0.000
borate	abstract	1	0.000
ester group	abstract	1	0.000
favourable	abstract	1	0.000
safety factor	abstract	1	0.000
secretion	abstract	1	0.000

Show all concepts from the description section