

Search query (2): [SP]: field of the invention[0001] this technology is oriented towards the agriculture and livestock industry, mainly the former, and is designed to improve agricultural soils, enabling an increase in the availability of nutrients when required by plants.state of the art[0002] the need to produce food products extremely quickly and in large quantities has led to a departure from traditional agricultural methods in order to obtain higher crop yields. these high yields, however, are made possible through the use of fertilizers that require great quantities of energy, mainly from fossil fuels. in addition, the disproportionate use of chemical fertilizers is one of the main causes of soil degradation. it is thus necessary to increase the application of more innocuous fertilizers to replace chemical fertilizers or at least reduce their excessive use.[0003] the most widely used fertilizers worldwide are mineral products containing mainly nitrogen (n), phosphorus (p) and potassium (k). these products are considered indispensable for providing the amount of nutrients necessary for optimal crop yields. nonetheless, many factors associated with the use of chemically-synthesized fertilizers are currently the subject of intense debate. these include: 1) the reduction of global reserves of phosphate rock 2) environmental pollution caused by the chemical synthesis of nitrogen and phosphorus fertilizers 3) environmental pollution caused by the application of fertilizers to soils and 4) the inefficiency of fertilizer use.[0004] calculations regarding the remaining reserves of phosphate rock, the most important mineral used to synthesize phosphorus fertilizers, have varied in recent years (van vuuren et al., 2010). this is due to the large number of factors affecting the availability of this resource and their unpredictability. relevant factors include the demand for phosphorus fertilizers, the diverse technical methods for quantitatively estimating phosphate rock reserves, new agricultural policies, the economic crisis, geopolitical instability and market distortions (cordell et al., 2011). an example of such a market distortion was the global food crisis of 2008, during which the price of phosphate rock commodities increased by 800 percent over a period of 18 months. in addition, most studies on phosphate rock reserves are based on estimates carried out by each country and reports from scientific and industrial assessments using a variety of technical methods (jasinski, 2010). according to many authors, a defining moment in the availability of phosphorus fertilizers will be what is known as the phosphate rock production peak (dery and anderson, 2007 cordell et al., 2009 cordell et al., 2011a), defined as the moment in which the maximum quantity of high-quality phosphate rock is produced at a low price. after this point has been reached, the production of phosphate rock will diminish irrespective of the growing market demand, mainly due to economic and energy limitations (cordell et al., 2011a). different studies regarding the phosphate rock production peak generally predict this moment occurring within the next 20 to 70 years (cordell et al., 2009 van kauwenbergh, 2010 lindstroem et al. cordell and white 2011). this high degree of vulnerability of the global phosphate rock market makes it necessary to diversify sources of p by investing in renewable phosphorus fertilizers and/or recuperating all sources of p present in the food chain more efficiently.[0005] at a global level, it is widely recognized that the production of fertilizers requires large amounts of energy and is a significant source of greenhouse gases. it has been estimated that fertilizer production consumes 1.2 percent of all global energy and causes around 1.2 percent of greenhouse gas emissions (kongshaugh, 1988). in the case of nitrogen fertilizers, the main greenhouse gases emitted are co₂, generated through the combustion of natural gas for ammonia synthesis, and nitrous oxide, released during the production of nitric acid. the production of phosphorus fertilizers is also responsible for the emission of large quantities of co₂ due to the use of fossil fuels throughout the production process (wood and cowie, 2004).[0006] nitrogen and potassium fertilizers generally contain low concentrations of as, cd and pb, and therefore do not contribute significantly to the accumulation of toxic elements in soils and crops (raven and loeppert, 1997 luo et al., 2009). phosphorus fertilizers, however, can contain a high concentration of heavy metals (as), depending on the type and source of the mineral from which the phosphorus is extracted (jiao et al., 2012 chanev, 2012). in general terms, sedimentary phosphate rock contains a greater concentration of impurities, including toxic elements, than igneous phosphate rock (hartley et al., 2012). unfortunately, no economically feasible processes for removing the contaminants present in phosphate rock have been developed to date (stacey, 2010). although studies measuring the concentration of arsenic in more than 300 samples of phosphorus fertilizers of various origins obtained relatively low arsenic concentrations, with an average of between 7.6 mg kg⁻¹ and 20 mg kg⁻¹ of as in over 90 percent of the samples (nziguheba and smolders, 2008 jiao et al., 2012), the reduction in sources of high quality phosphate rock makes it highly likely that there will be a tendency to increase the use of phosphate rocks from sources with a high concentration of heavy metals (stacey et al., 2010). it has been proven that the long-term use of phosphorus fertilizers with a high concentration of as considerably raises the concentration in soils of as, a highly persistent element that is absorbed by plants (hartley et al., 2013). being absorbed by plants allows it to reach the human food chain and create a high risk to human health. this could occur, for example, with the accumulation of as in rice grown in flooded conditions (meharg et al., 2009 meharg and zhao, 2012). other toxic elements contained in phosphorus fertilizers, such as cadmium (cd) and lead (pb) are present in more variable concentrations than as (jiao et al., 2012). in an assessment of 277 fertilizer samples, 16 percent contained a concentration higher than 100 mg kg⁻¹ of cd, with a similar tendency for pb (jiao et al., 2012).[0007] on the other hand, it has been observed that micronutrient fertilizers have a greater concentration of toxic elements such as cd and pb than phosphorus fertilizers and npk products (cdfa, 1998 epa us 1999).[0008] eutrophication, both natural and anthropogenic, consists of an accumulation of nutrients in surface waters, stimulating the growth of aquatic flora. in general, the nutrient that most contributes to algae growth in this case is p, as some algae species such as blue-green algae can biologically fixate atmospheric n (chien et al., 2011). the main source of p for water eutrophication is agriculture (epa, 2009), due to the surface runoff of p dissolved in water (preedy et al., 2001). in this regard, many studies have observed a greater runoff of p from phosphorus fertilizers compared to animal slurry (bundy et al., 2001 preedy et al., 2001 tabara, 2003).[0009] the maximum efficiency of nitrogen, phosphorus and potassium fertilizers applied directly to soils is around 55 percent, 35 percent and 60 percent, respectively. thus, the total global loss of n, for example, can reach 9.45 million t each year. in order to increase the efficiency of fertilizers, products such as slow-release and controlled-release fertilizers, as well as urease and nitrification inhibitors have been developed (xiang et al., 2008). however, these technologies are only aimed at reducing nutrient loss, instead of enabling the liberation of nutrients according to plant requirements at each phenological stage.[0010] in soils, the fraction of organic nutrients is greater than that of inorganic nutrients. inorganic n, for example, is one of the most unstable elements in soils due to a series of processes causing its loss, such as: the leaching of no₃⁻ biological denitrification leading to losses of n in the form of n₂ and n₂o chemical denitrification where n is lost in the form of no_x, n₂o and n₂ volatilization causing the loss of n in the form of nh₃ and soil erosion leading to the loss of n in the form of nh₄⁺ and organic n. due to these losses, it is not possible for n to accumulate in soils in an inorganic form. on the other hand, n accumulates naturally in soils in its organic forms in organic and/or composted matter. the amino acids asparagine and glutamine, for example, are two of the most abundant forms of organic n in soils. in fact, some studies have shown that the percentage of nh₄⁺ liberated during asparagine and glutamine hydrolysis was equal to the sum of these substrates present in humic acids (bremner, 1955 sowden, 1958). the mineralization of these amino acids is catalyzed by the enzymes l-asparaginase and l-glutaminase. thus, both enzymes fulfill an important role for the mineralization of n in soils and its subsequent availability for plants (hojati and nourbakhsh, 2007 nourbakhsh and alinejadani, 2009).[0011] as with n, organic sulfur (s) in soils comprises approximately 98 percent to 99 percent of the total sulfur content (tabatabai, 1982). of the total organic s ([500 to 1500 mg s kg⁻¹ soil]) contained in the soil profile and organic residues, the form ester sulfate (r-o-so₃h) corresponds to 30 percent to 75 percent (aguilera et al., 2002). ester sulfate is considered the most labile form of sulfur

Results: 3

Search history

Search PN=(WO2015100513) (Results 1)

1:

2: [SP]: field of the invention[0001] this technology is oriented towards the agriculture and livestock industry, mainly the former, and is designed to improve agricultural soils, enabling an increase in the availability of nutrients when required by plants.state of the art[0002] the need to produce food products extremely quickly and in large quantities has led to a departure from traditional agricultural methods in order to obtain higher crop yields. these high yields, however, are made possible through the use of fertilizers that require great quantities of energy, mainly from fossil fuels. in addition, the disproportionate use of chemical fertilizers is one of the main causes of soil degradation. it is thus necessary to increase the application of more innocuous fertilizers to replace chemical fertilizers or at least reduce their excessive use.[0003] the most widely used fertilizers worldwide are mineral products containing mainly nitrogen (n), phosphorus (p) and potassium (k). these products are considered indispensable for providing the amount of nutrients necessary for optimal crop yields. nonetheless, many factors associated with the use of chemically-synthesized fertilizers are currently the subject of intense debate. these include: 1) the reduction of global reserves of phosphate rock 2) environmental pollution caused by the chemical synthesis of nitrogen and phosphorus fertilizers 3) environmental pollution caused by the application of fertilizers to soils and 4) the inefficiency of fertilizer use.[0004] calculations regarding the remaining reserves of phosphate rock, the most important mineral used to synthesize phosphorus fertilizers, have varied in recent years (van vuuren et al., 2010). this is due to the large number of factors affecting the availability of this resource and their unpredictability. relevant factors include the demand for phosphorus fertilizers, the diverse technical methods for quantitatively estimating phosphate rock reserves, new agricultural policies, the economic crisis, geopolitical instability and market distortions (cordell et al., 2011). an example of such a market distortion was the global food crisis of 2008, during which the price of phosphate rock commodities increased by 800 percent over a period of 18 months. in addition, most studies on phosphate rock reserves are based on estimates carried out by each country and reports from scientific and industrial assessments using a variety of technical methods (jasinski, 2010). according to many authors, a defining moment in the availability of phosphorus fertilizers will be what is known as the phosphate rock production peak (dery and anderson, 2007 cordell et al., 2009 cordell et al., 2011a), defined as the moment in which the maximum quantity of high-quality phosphate rock is produced at a low price. after this point has been reached, the production of phosphate rock will diminish irrespective of the growing market demand, mainly due to economic and energy limitations (cordell et al., 2011a). different studies regarding the phosphate rock production peak generally predict this moment occurring within the next 20 to 70 years (cordell et al., 2009 van kauwenbergh, 2010 lindstroem et al. cordell and white 2011). this high degree of vulnerability of the global phosphate rock market makes it necessary to diversify sources of p by investing in renewable phosphorus fertilizers and/or recuperating all sources of p present in the food chain more efficiently.[0005] at a global level, it is widely recognized that the production of fertilizers requires large amounts of energy and

is a significant source of greenhouse gases. it has been estimated that fertilizer production consumes 1.2 percent of all global energy and causes around 1.2 percent of greenhouse gas emissions (kongsshaugh, 1988). in the case of nitrogen fertilizers, the main greenhouse gases emitted are CO_2 , generated through the combustion of natural gas for ammonia synthesis, and nitrous oxide, released during the production of nitric acid. the production of phosphorus fertilizers is also responsible for the emission of large quantities of CO_2 due to the use of fossil fuels throughout the production process (wood and cowie, 2004). 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[0009] the maximum efficiency of nitrogen, phosphorous and potassium fertilizers applied directly to soils is around 55 percent, 35 percent and 60 percent, respectively. thus, the total global loss of n, for example, can reach 9.45 million t each year. in order to increase the efficiency of fertilizers, products such as slow-release and controlled-release fertilizers, as well as urease and nitrification inhibitors have been developed (xiang et al., 2008). however, these technologies are only aimed at reducing nutrient loss, instead of enabling the liberation of nutrients according to plant requirements at each phenological stage. [0010] in soils, the fraction of organic nutrients is greater than that of inorganic nutrients. inorganic n, for example, is one of the most unstable elements in soils due to a series of processes causing its loss, such as: the leaching of NO_3^- biological denitrification leading to losses of n in the form of N_2 and N_2O chemical denitrification where n is lost in the form of NO_x , N_2O_x and N_2 volatilization causing the loss of n in the form of NH_3 and soil erosion leading to the loss of n in the form of NH_4^+ and organic n. due to these losses, it is not possible for n to accumulate in soils in an inorganic form. on the other hand, n accumulates naturally in soils in its organic forms in organic and/or composted matter. the amino acids asparagine and glutamine, for example, are two of the most abundant forms of organic n in soils. in fact, some studies have shown that the percentage of NH_4^+ liberated during asparagine and glutamine hydrolysis was equal to the sum of these substrates present in humic acids (bremner, 1955 sowden, 1958). the mineralization of these amino acids is catalyzed by the enzymes l-asparaginase and l-glutaminase. thus, both enzymes fulfill an important role for the mineralization of n in soils and its subsequent availability for plants (hojjati and nourbakhsh, 2007 nourbakhsh and alinejadian, 2009). [0011] as with n, organic sulfur (s) in soils comprises approximately 98 percent to 99 percent of the total sulfur content (tabatabai, 1982). of the total organic s [(500 to 1500 mg s kg^{-1} soil)] contained in the soil profile and organic residues, the form ester sulfate (r-o-so₃h) corresponds to 30 percent to 75 percent (aguilera et al., 2002). ester sulfate is considered the most labile form of sulfur (Results 3)

Title: METHOD FOR PRODUCING A MATERIAL WITH A GROUND CLAY AND GROUND ROCK BASE THAT PROMOTES PLANT GROWTH AND THE RESULTANT PRODUCT

Abstract: Source: US2004194376A The invention relates to a ground material, obtained by grinding mineral materials. Said ground material is mixed with matured compost and/or sludge, obtained by the elutriation of mature compost and is matured under controlled conditions, in particular at a temperature limited to 60 degrees centigrade, for several weeks or several months. During said maturing process, the mineral material decomposes and biological activation occurs by means of the micro-organisms (fungi etc.) that have formed during the activation phase. The product thus obtained has an improved action for promoting plant growth. In a preferred embodiment, a plant seed cultivation is carried out on the activated substrate, in particular a thin layer cultivation. The green matter that has been formed, in addition to the substrate with interspersed roots, can e.g. be ground to produce an enriched product. The advantages already offered by the activated product are demonstrated by the addition of the green matter that has formed to inactivated (41, 43, 46) and activated material (42, 44, 45).

Classifications:

International (IPC 8-9): C05D9/00 C05F17/00

C05F9/04 (Advanced/Invention);

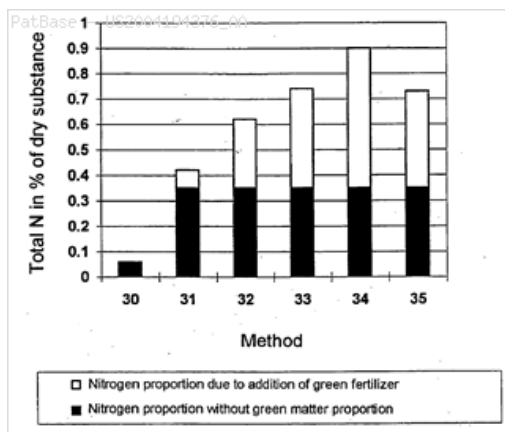
C05D9/00 C05F17/00 C05F9/00 (Core/Invention)

International (IPC 1-7): A01G31/00 C05F17/00 C05F9/04

CPC: Y02W30/43 C05F17/0045 C05D9/00 C05F9/04 Y02P20/145

European: C05D9/00 C05F17/00K C05F9/04

US: 47/58.1SC



Family:

Publication number	Publication date	Application number	Application date
AU2002245994 AA	20021105	AU20020245994	20020419
CA2445075 AA	20031022	CA20022445075	20020419
CA2445075 C	20100914	CA20022445075	20020419
EP1381581 A1	20040121	EP20020713989	20020419
US2004194376 AA	20041007	US20040475561	20040505
US7080481 BB	20060725	US20040475561	20040505
WO02085815 A1	20021031	WO2002CH00219	20020419

Priority:

CH20010000737 20010423 WO2002CH00219 20020419

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Assignee(s): IUP INST ; IUP INSTITUT UMWELTPFLEGE AG ; IUP INSTITUT FUER UMWELTPFLEGE AG ; IUP INSTITUT FUR UMWELTPFLEGE AG

Inventor(s): (std): BAUMANN GERHARD

Agent(s): FETHERSTONHAUGH AND CO; YOUNG AND THOMPSON

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ OM PH PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW

Title: BIOLOGICAL FERTILIZER, METHOD FOR OBTAINING SAME AND USE THEREOF AS A PLANT GROWTH STIMULATOR

Abstract: Source: US2011045976A The invention relates to a novel biological fertiliser, a method for obtaining same and the use thereof as a plant growth stimulator, said fertiliser comprising a pure culture of strain C3 of *Pantia dispersal*, a pure culture of strain M3 of *Azospirillum brasilense* and indole-3 acetic acid, all of which are immobilised in a single solid medium acting as a slow release system. The method includes the following main steps: culture of the microorganisms; immobilisation of the cells, nutrients and other substances in the medium; and a single fluid bed drying step which enables lower temperatures to be used and lower moisture contents to be obtained, thereby providing the fertiliser with greater stability. The action of the fertiliser commences upon contact with the plant.

Classifications:

International (IPC 8-9): A01N59/04 A01N63/00 C05F11/08

C12N1/20 C12N11/14 C12R1/01 (Advanced/Invention);

C12R1/01 (Advanced/Non-invention);

A01N63/00 C05F11/00 C12N1/20 (Core/Invention)

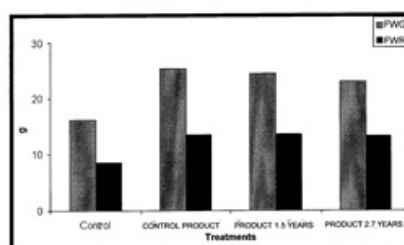
CPC: C12N1/20 A01N63/00 C05F11/08 C12N11/14 C12R1/01

European: A01N63/00 C05F11/08 C12N1/20 C12N11/14 C12R1/01

US: 504/101 504/117 71/6

PatBase - US2011045976_AA

— Stability test of the product at room temperature



Family:

Publication number	Publication date	Application number	Application date
AU2007358190 AA	20090305	AU20070358190	20070827
AU2007358190 BB	20130912	AU20070358190	20070827
BRPI0722102 A2	20140408	BR2007PI22102	20070827
CN101842334 A	20100922	CN200780101303	20070827
CN101842334 B	20131120	CN200780101303	20070827
CY1117255 T1	20170426	CY20151101045T	20151119
DE602007042694 D1	20151001	DE200760042694T	20070827
EP2194032 A1	20100609	EP20070822905	20070827
EP2194032 A4	20130227	EP20070822905	20070827
EP2194032 B1	20150819	EP20070822905	20070827
ES2551678 T3	20151123	ES20070822905T	20070827
PT2194032 T	20151125	PT20070822905T	20070827
US2011045976 AA	20110224	US20100675863	20100831
US8242053 BB	20120814	US20100675863	20100831
WO09027544 A1	20090305	WO2007ES00497	20070827

Priority:

EP20070822905 20070827 WO2007ES00497 20070827

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Assignee(s): PROBELTE SA ; PROBELTE ESPINARDO SA

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Inventor(s): ANA ISABEL FERNANDEZ MARTINEZ ; JUAN ANTONIO CASANOVA ROCA ; JOSE ANTONIO NICOLAS MARTINEZ ; MARIO JORGE VILLAYERDE FERNANDEZ ; MAZ PEDRO

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RATNERPRESTIA; TORNER JUNCOSA I ASSOCIATS SL

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: PROCESS FOR PRODUCING A BIOFERTILIZER COMPRISING THE STEPS OF SOLID-STATE FERMENTATION, IMMOBILIZATION THROUGH ALLOPHANE NANOPARTICLES AND A SECOND FERMENTATION; AND THE SAID BIOFERTILIZER

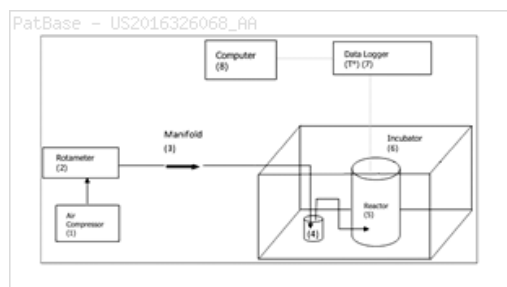
Abstract: Source: US2016326068A Process for producing a biofertilizer, comprising the following steps: a) solid-state fermentation to produce enzymes and nutrients critical for plant nutrition; b) immobilization through allophane nanoparticles of the enzymes and substrates produced during stage a); and c) a second fermentation to favor the development of microorganisms that improve the quality of the biofertilizer. Protection is also sought for the biofertilizer that is produced from this process.

Classifications:

International (IPC 8-9): A01N63/02 C05B17/00 C05F17/00 C05F17/02 C05F3/00 C05F3/02 C05F3/06 C05F5/00 C05G3/00 C12N11/04 (Advanced/Invention)

CPC: Y02P20/145 Y02W30/43 C05F3/06 C05F3/00 C05F17/0027 C05F17/0258 C05F17/0063 C05G3/0041 C05B17/00 C05F17/0045 C05F17/0036

US: 71/9



Family:

Publication number	Publication date	Application number	Application date
CL2013003780 A1	20140620	CL20130003780	20131230
CL54342 B	20170623	CL20130003780	20131230
CO20160000459 A2	20161031	CO20160000459	20160729
EP3090994 A1	20161109	EP20140876078	20141224
EP3090994 A4	20170118	EP20140876078	20141224
US2016326068 AA	20161110	US20140109204	20141224
WO15100513 A1	20150709	WO2014CL00087	20141224

Priority:

CL20130003780 20131230 WO2014CL00087 20141224

Probable Assignee: UNIVERSIDAD DE CONCEPCION

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Assignee(s): UNIVERSIDAD DE CONCEPCION ; UNIVERSIDAD DE TALCA

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Inventor(s): ROXANA SOFIA LOPEZ EMPARAN ; ROSAS GAJARDO ANALI ; ANALI ESTELA ROSAS GAJARDO ; LOPEZ EMPARAN ROXANA

Agent(s): XIMENA SEPULVEDA BARRERA; CAROLINA MERCEDES DAZA MONTALVO; CARVAJAL Y URQUIJO ISABEL; SEPULVEDA BARRERA XIMENA

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW