Proses bioremediasi pdf online free online

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SISTEM BIOREAKTOR

Oleh: Satria Pasthika (1306371041)

Bioreaktor adalah sebuah wadah untuk melakukan proses kimia yang melibatkan organisme atau substansi biokimia aktif yang diambil dari makhluk hidup. Bioreaktor memiliki sistem yang mendukung pertumbuhan mikroorganisme dengan memberikan lingkungan yang sesuai untuk menghasilkan produk mikrobial yang dapat dimanfaatkanBiasanya bioreaktor berbentuk silinder, berkisar dari beberapa liter sampai meter kubik, dan dibuat dari bahan *stainless steel*.

Menurut Saepudin dan Sateakasih (2009) bioreaktor/reaktor biologi/fermenter suatu wahana/ tempat untuk keberlangsungan proses fermentasi/transformasi bahan dasar menjadi produk yang diinginkan yang dilakukan oleh sistem enzim dalam mikroba atau enzim yang diisolasi. Bioreaktor merupakan sistem tertutup untuk reaksi biologis dr suatu proses bioteknologi.

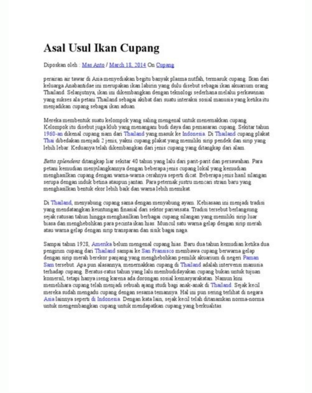
Fungsi dasar dari bioreaktor adalah memberikan lingkungan yang terkontrol (suhu, pH, O_2 terlarut, dll) untuk pertumbuhan mikroba dalam menghasilkan produk yang diinginkan. Fungsi bioreaktor adalah untuk menghasilkan produk oleh mikrobia baik kultur murni atau campuran, yang dikendalikan menggunakan sistem komputer dalam mengatur faktor lingkungan dan pertumbuhan serta kebutuhan nutriennya. Menurut Pujaningsih (2005), fungsi dasar fermentor/bioreaktor yaitu menyediakan kondisi lingkungan yang cocok bagi mikroba di dalamnya untuk:

1. Menghasilkan biomassa
2. Menghasilkan enzim
3. Menghasilkan metabolit

Penggunaan bioreaktor dalam industri dapat dikelompokkan menjadi 3 kelompok, yaitu sistem bioreaktor *batch* (curah), sistem bioreaktor semi kontinu, dan sistem bioreaktor kontinu.

- **Sistem Bioreaktor *Batch***

Sistem bioreaktor *batch* merupakan fermentasi dengan cara memasukan media dan inokulum secara bersamaan ke dalam bioreactor dan pengambilan produk dilakukan pada akhir fermentasi. Pada sistem *batch*, bahan media dan inokulum dalam waktu yang hampir bersamaan di masukan ke dalam bioreactor, dan pada saat proses berlangsung



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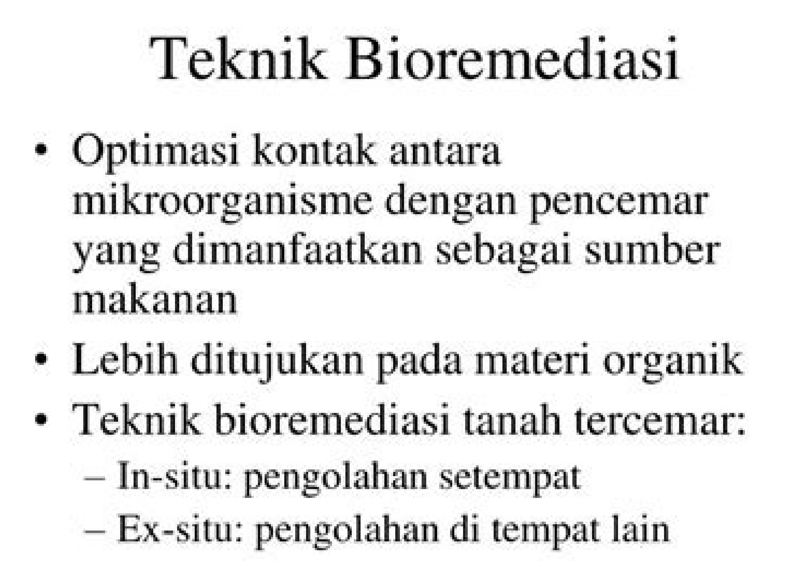

1341 - 1360 of 1405 results. Andreas Panjaitan â ¢ IMam Suprayogi â ¢ Trimaijon Trimaijon â ¢ February 2014 The erosion of sedimentation that is happy at the Duri Canal is a problem that must be described in the analysis of DAS because the Duri channel is multifunctional of the channel that is useful in wealthl. people. Metho ... Arif Hamidi L. â€ ¢ Aman Aman â€ ¢ Drastinawati Drastinawati â â â€ ¢ February 2014 The use of coal as fuel in industry gives rise to furnaces and bottom ash. Flying ashes have a high content of silica and alumina, so it can be potentially used as building materials. Fly A ... Sari D. P. â€ ¢ Padil Padil â€ ¢ Yelmida Yelmida â€ ¢ February 2014 Midrib Palm is one of the waste produced by palm agriculture that contain alpha cellulose about 35%. The component of alpha cellulose could be used as raw material for nitrocellulose if it is ... 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Bioremediasi mengacu pada segala proses yang menggunakan mikroorganisme seperti bakteri, fungi (mycoremediasi), yeast, alga dan enzim-enzim yang dihasilkan oleh mikroba tersebut untuk memberihkan atau menetralkan bahan-bahan kimia dansi limbara ♪ ♪ ♪ ♪ Selain digunakan untuk proses eksplorasi minyak bumi dan gas, bioremediasi telah digunakan di berbagai aplikasi industri lainnya, misalnya untuk memberihkan minyak baik by dalam dan sekitar pabrik-pabrik amunisi militerah Setelah senyawa minyak dimakan, proses pencernaan pada mikroba tersebut secara alami mengubah senyawa minyak menjadi air dan gas yang tidak berbahaya dan aman bagi lingkungan. Proses bioremediasi mengembalikan tanah ke bentuk asalnya, sehingga aman untuk digunakan of berbagai jenis lingkungan baik untuk kegiatan pertanian, perkebunan, peternakan dan lain â€" lain. Bioremediase sepenuhnya menggunakan mikroba yang secara alami dan dapat hidup of tanah. Mikroba tersebut membahayakan lingkungan. Mikroba diberi nutrisi berupa pupuk yang lazim digunakan di taman dan lahan kebun agar tumbuh dan bekerja secara efektif sehingga bisa mempercepat proses remediasi dan juga tidak ada tambahan bahan kimia berbahaya selama proses bioremediasi. Bioremediasi sudah di uji dengan Standar Pengujian Tanah (SPT) dengan menggunakan Total Petroleum Hydrocarbon (TPH) yakni persentase kandungan minyak mentah pada tanah yang terpapar untuk menentukan tingkat aman bagi lingkungan.Di Indonesia maupun Internasional, bioremediasi dianggap sebagai proses yang mudah dan efektif untuk mengolah tanah terpapar minyak dengan TPH maksimal 15%. Pengujian dilakukan secara bertahap selama siklus pengolahan untuk parameter TPH dan pH. Saat hasil pengujian TPH tanah sudah kurang atau sama dengan 1%. Tanah dapat dipindahkan dari lokasi pengolahan dan dinyatakan aman untuk lingkungan. Selain itu kelebihan dari penggunaan bioremediasi adalah aman digunakan, mudah diterapkan, harganya murah, dapat dilaksanakan dimana saja dan dapat menghapus resiko kerusakan lingkungan jangka panjang. Namun dibalik semua kelebihannya, Bioremediasi memiliki kekurangan seperti pemantauan yang harus intensif, membutuhkan lokasi tertentu, menghasilkan produk yang tidak dikenal dan tidak semua bahan kimia dapat diolah. Tetapi seiring dengan berkembangnya sains dan teknologi, bioremediasi dapat dikembangkan lebih baik lagi.Bioremediasi sangat dianjurkan sebagai metode yang aman dan efektif oleh badan-badan lingkungan hidup di seluruh dunia untuk perusahaan tambang dan industri yang mengadakan kegiatan produksinya. Badan Ã¢Ã¢ÃÂ¬Ã¢ÃÂÂ badan lingkungan hidup yang menganjurkan metode ini sepertiCanadian Environmental Quality Guidelines, Canada-Wide Standards for Petroleum Hydrocarbons in SoildanUS Environmental Protection Agency. Negara-negara Uni Eropa juga menerapkanDutch Standarduntuk bioremediasi di masing Ã¢Ã¢ÃÂ¬Ã¢ÃÂÂ masing wilayahnya. Oleh karena itu Indonesia should use this biorisanary technology and also develop it to socialize in the community, not to limit its use that in reality took place in Indonesia. The microbters that live in the earth and in the groundwater can be "eating a certain dangerous, especially organic chemical, for example various types of oil. The microbes convert these chemicals into water and harmless gases such as CO2. The bacteria they use specifically Carbon from oil hydrocarbons as a food source are called oil bacteria. This bacterium plays an important role in environmental biorisature which is contaminated with oil waste. The main factor so that microbes can clean dangerous chemicals from the environment, That is to say the presence of appropriate microbes and available environmental conditions in which microbes grow as temperature, pH, pH, nutrients and quantities of oxygen. Biorisathane is very safe to use because it uses microbes that naturally exist in the environment (earth). This microbo is a microbial that is not harmful to the environment or the community. It is also said That biorisature is safe because it does not use/ adds chemicals in the process. The nutrients used to help the growth of microbes are fertilizers used in agricultural activities and plantations. The biorisature converts the chemicals harmful in water (H2O) and harmless gas (CO2), the dangerous compounds are completely eliminated. Biorisan technology is widely used in pollution in the soil due to some benefits that use natural processes / bioprocessors. The contaminated soil or groundwater can be restored in a place without having to interfere with local activities because the process of removing pollutants is not carried out. This technique is called processing in Biorisanic technique applied in Indonesia is an ex-situ technique, which is the process of processing in planned placeThe polluted soil / pollutants is removed on the processing site. The time needed to complete the processing depends on the type and number of pollutants to be processed, the size and depth of the polluted area, the type of soil and the local conditions and the techniques used. While heavy crude oil (heavy grit) will take time from 1 year or more. This condition varies from one polluted area with another area, so that the time required in the range from 4 months to 1 year. End Point (End Point) to assert that the bioresabling process has succeeded and completed is the total concentration of oil hydrocarbons (TPH) 1%. LH 128/2003 Kepmen for now uses only TPH parameters because the activities that implement biorisanese technology are still limited to the oil and gas industry. The costs needed to carry out the bio-resabling are between 25 years per tonne of processed land, depending on the conditions of pollution. This price is even cheaper than using other processing techniques such as incines that can reach from 4 to 10 times. Bioresabling as technology that can be used to clean up various types of pollutants does not mean limitless. Bioresabling cannot be applied to all types of pollutants, for example for pollution with very high concentrations of pollutants so that toxic to microbes or heavy metal pollutants such as cadmium and PB. In the future, the application of biorisanese technology in Indonesia will develop not only limited to the recovery of oil polluted land in industryand gas, but also pollution in the automotive industry, service stations and other sectors pertanian. Dengan demikian, polutan targetnya bukan hidrokarbon minyak bumi saja tetapi juga senyawa inorganik lainnya seperti pestisida.Pendekatan molekular misalnya identifikasi mikroba dengan 16sRNA atau 18sRNA untuk mengetahui keberlimpaphan mikroba dalam proses bioremediasi dapat dilakukan untuk meningkatkan kinerja bioproses. Teknologi molekular ini sudah tersedia dan dibandingkan dengan teknik identifikasi konvesional yang saat ini umum digunakan di Indonesia memberikan waktu pemeriksaan lebih cepat. Namun demikian, penggunaan teknik molekular ini masih mahal dan belum perlu sebagai prioritas.Aplikasi bioremediasi di Indonesia mengacu pada Keputusan Menteri Negara Lingkungan Hidup Nomor 128 Tahun 2003 (KepMen LH no. 128/2003) mengatur tentang tatacara dan persyaratan teknis pengolahan limbah dan tanah terkontaminasi oleh minyak bumi secara biologis. Disini dicantumkan bahwa bioremediasi dilakukan dengan menggunakan mikroba lokal. Pada umumnya, di daerah yang tercemar jumlah mikroba yang ada tidak mencukupi untuk terjadinya bioproses secara alamiah. Dalam teknologi bioremediasi dikenal dua cara menstimulasi pertumbuhan mikroba, yaitu denganbiostimulaidanbioaugmentasi. Biostimulasiadalah memperbanyak dan mempercepat pertumbuhan mikroba yang sudah ada di dalam tanah tercemar dengan cara memberikan lingkungan pertumbuhan yang diperlukan, yaitu penambahan nutrient (misalnya sumber Nitrogen dan Phospor) dan oksigen. Jika jumlah mikroba yang ada sangat sedikit, maka harus ditambahkan mikroba untuk mencapai jumlah mikroba rata-rata 10^3 cfu/gram* tanah sehingga bioproses dapat dimulai. Mikroba yang ditambahkan adalah mikroba yang sebelumnya diisolasi dari lahan tercemar kemudian setelah melalui proses penyesuaian di laboratorium diperbanyak dan kembalikan ke tempat asalnya untuk memulai bioproses. Penambahan mikroba dengan cara ini disebut sebagaibioaugmentasi.Kondisi lingkungan yang memadai akan membantu mikroba ilocirga ittodorp ius enigadnI .isakol irad hanat nakhadnimem nikgnum kadit akitek isidnok adap nakanugid aynasaib nad natukgnasreb gnay isakol id kaynim rapapret gnay iretam sesorpmem ini edoteM .utiS-nI edotem halada amatreP: isaidemeroib malad nakanugid aynasaib gnay edotem aud ada ,isaidemeroib naiakamep isakol nakrasadreB .nainatrep kutnu nahal napaisrep taas adap hanat nakilabmep nagned amas nakukalid gnay hanat nakilabmep sesorp anerak nakanugid gnimrafdnal amaN .nakkilab id tubesret hanat narapmah alakreb araces akam aradu nagned katnokret haloid gnay hanat irad naigab aumes awhab nimajnem kutnU .aradu nagned aborkim katnok naknikgnumem mc 05 â¬â¢Â 03 hanat narapmah nalabeteK .aira padek nasipal sataid ramecret hanat nakrapmahgnem nagned nakukalid gnimrafdnal kinkeT .irtem 5,1 iapmas 1 halada nanubmit hanat naiggnitek ,ini kinket nagneD .aradu nagned katnokreb natulop nad aborkim gnudnagnem gnay hanat naigab aumes aggnihes naapiprep gnujuid gnasapid aradu apmoP .ramecret hanat nakupmut hawabid)aradu nairebmep(isarea kutnu naapiprep gnasamem nagned nakukalid aborkim helo nakulrepid gnay aradu ialpus nad ria padek nasipal sataid nubmitid ramecret hanat ,elipoib kinket adaP .gnimrafdnal nad elipoib utiay nakparetid mumu tagnas gnay kinket aud lanekid isaidemeroib kinket isakilpa malaD .fitkefe gnay isaidemeroib sesorp naktapadnem kutnu gnitnep nanarep gnagemem raneb gnay)airengegni id ngised(sinket naanacnerep ,naikimed nagneD .ramecret gnay aera id nakumetid tapad kadit ini nakulrepid gnay isidnok mumu araceS .itam uata tabmal nagned hubmut naka aborkim ,ihunepret kadit nakhutubid gnay isidnok akij aynkilabeS .)nahubmutrep kutnu igrene rebmus iagabes snatulop irad nobraC naktaafnamem uata(tubesret natulop ¬â¢ÂnakamemÂ¬â¢Â nad gnabmekreb In addition, the bioremediation process requires regular irrigation and soil aeration for a certain period of time. Soil aeration inside and around the location of the production of oil is difficult, sometimes even impossible to do without stopping production. Thus, this method can cause loss of oil prodotto capacity from the location concerned for a long time. This method processes the material exposed to oil in the location concerned and is usually used in conditions when it is not possible to move the soil from the location. However, the in-situ method is considered less effective for exploration and production of oil because the location exposed to the oil can not be used until the bioremediation process is completed. In addition, the bioremediation process requires regular irrigation and soil aeration for a certain period of time. Soil aeration inside and around the location of the production of oil is difficult, even sometimes it is impossible to do without stopping production. Thus, this method can cause loss of oil prodotto capacity from the location concerned for a long time. Next is the ex-situ method in this method, the material exposed to oil is dug and sent safely to a location specifically designed to process and clean up the soil effectively and efficiently. The processing location consists of several processing cells that are periodically carried out the process of watering and piracy to ensure aeration runs well. Between irrigation and aeration activities, the location is allowed to stand so that microbes can work to eat oil compounds. EX-Situ is a method that is proven to be effective for processing soil exposed to oil because this method allows processing without disrupting the production process. In this method, the material exposed to oil is excavated and /otadarged etnemlaizraP .2)aloc acoc e enobrac id ituifir ien orunaic ,olonef(enobrac id itsopmoC ¢Â ilairtsudni itnevlos inucla)enelatfan ,anelix ,aneuot ,enezneb(irefilortep itsopmoc ¢Â ¢Â ¢Â ¢Â)arefilortep elibitsubmoc ,leseid ,sag(itadarged-oib eresse onossop ehc irefilortep ittodorP .1 :euges emoc ilairetam ied enoizisopmoced al rep enoizulos anu eresse ²Âup etnanimatnoc otnemanasiroib id opit , Âtinilas ,arutarepmet ,Hp emoc ,enoizaredisnoc ni oserp eresse eveD elamissam ottatnoc len eresse eved otartsbus e elaiznesse ocinagroni enoizirtunmpp 1 oudiser ollevil a onegisso'l :onanasiroib ossecorp len itnatropmi etnemarev e esab id itisiuqer id otnemirefsart id ossecorp o enoisrepsid ,gninruB ,otnemibrossa ,otnemibrossa ,enoizaripsa :ilanoiznevnoc enoizarobale id idotem ia ottepsir eroirefni otlom eresse ²Âup acinasiroib aigoloncet al etnaidem isonnad ituifir id itis ied enoizarobale otseihcir ovacs id ossecorp lus otasab enoizarobale id ossecorp la ottepsir elatneibma enoizetorp id aznetop eroilgim anu ah etnemlareneg otnemanasiroib li ;irtla ilG .elatneibma ozzem nu ad itnanimatnoc id otnemirefsart lI olos non

,esolocirep eznatsos olos non ,etteifinomiD letasaB lacigoloiB noitsudeR :itneuges i onos elareneg ni otnemanasiroib alled icifeneb i adraugir otnauq reP .enoizudorp id ossecorp li erepmorretni aznes enoizaroval al etnesnoc odotem otseuq ©Ãhcrep oiggerg oilortep la otsopse olous led enoizarobale'l rep ecaciffe otartsomid ¨Ã is ehc odotem nuââ ¨Ã utis xe'L .oilo itsopmoc eraignam rep eranoiznuf onassop iborcim i ehc odom ni ideip ni erats ²Ãup enoizisop al ,enoizarea e enoizagirri id ¨Ãtivitta el arT .eneb inoiznuf enoizarea'l ehc eritnarag rep airetarip e enoizagirri id ossecorp li atautteffe etnemacidoirep eneiv ehc enoizaroval id allec anu ad atiutitsoc ¨Ã enoizarobale id enoizisop aL .etneiciffe de ecaciffe odom ni onerret li erilup e erarobale rep atattegorp etnematisoppa enoizisop anu ni orucis odom nI for (tichlororetilene) which will pollute underground watersPCE (Pendelhorethlene) Lavaggio a secco solvent Ã ¢ â,¬Â ¢ pcb (has been degraded in the laboratory, but not in the field of field work) Ã ¢ â,¬Â ¢ Arsenic, Chromium, Selenium3. Not degradabile / calcificante ¢ à,¬tm uranium Ã ¢ â,¬Â ¢ mercury Ã ¢ â,¬Â ¢ ddoudomonas, achromobacter, bacillus. Arthrobacter, Penicillum, Aspergillus, Fusarium, PhanerocheateCadmium : Staphlococcus, Bacillus, Pseudomonas, Citrobacter, Klebsiella, Rhodococcusulfur : ThiobacillusChromium : lcaligeneonas, Peudomscher Adapun anggota aktif dari konsorsium mikroba dalam bioremediasi : Alcaligenes denitrificansArthorbacterglobiformsArthrobacterspBacillus megateriumBerijerinckia spFlavobacteriumMethanobacteriumMycobacterium Stimolare i dati personali Bioremediasi untuk Pengolahan POPsTeknologi pengolahan POPs Currently many have been developed, for example as follows: The thermal destruction process at high temperatures using combustion with high temperatures and non-combustion technology (plasma arc, geo melt, gpcr, thermal desorption, and pyrolysis, etc.) technology Non-oxidative combustion (scwo, catalytic oxidation ,onegisso'lled acimihc e acigoloib enoizudir al Ãrelomits auqca'l e 0 ¨Ã orref li ,odarged li rep ocinagro elairetam emoc dnemarad id oiggetnoc led atnuigga'L .azneuqes ni ocisso e ocisso-na otnemanoizidnoc nu azzilitu ehc otnemanasiroib led acifidom anu ¨Ã aigoloncet atseuq etnemlatnemadnof aM .TDD e enefaxot ad itanimatnoc aznetop id otunetnoc ossab a ituifir erarobale rep atazzilitu atats ¨Ã ,dnemaraD ,dnemaraD id aigoloncet aL .5eugnas id otsap o eugnas len otsaP .itanimatnoc ilairetam ia itnuigga onognev Hp id itroppus emoc itazzilitu onognev ehc ,otafsof e ,itneirtun emoc itasu onognev ehc ,)erevlop ni ilamina id eugnas e occes(eugnas id aniraf al emoc icigoloib itnega ,enoizaroval al reP .iciboreana imsinagrorcim id etrap ad itnemides o olous len enefaxot led odarged id ollevil li eratnemua rep itnemadneme noc ossecorP etnemaenatlumis noitadargedoibnaflusodne noc otanimatnoc olous lad italosi ihgnuf odnasu ipmac ien italosi onerret id imsinagrorcim odnasu aciborea enoizadargedoib :itneuges el onos POP ied enoizarobale'llen osseccus ous len etacifitnedi etats onos ehc eiranasiroib eigoloncet elled enucla adraugir otnauq reP .itsuig irettab ied enoizeles e otnemanoizidnoc ,acifidom id ossecorp len ats ossecorp led osseccus li ©Ãhcrep ,oipicnirp id aenil ni evitacifingis eznereffid etlom ah non pop itsopmoc i rep otnemanasiroib li ,oipicnirp id aenil nI .atiugese etnemaipma atats ¨Ã POP ied enoizarobale'l e enoizisopmoced al rep atolip alacs ni enoizacilppa'lled otnemanasiroib id aigoloncet id ollevil li rep SPOP ied acifinob al rep oloclac non id aigoloncet aL . POP ied otnemanasir al rep enoissimmoc non id aigolonceT .1 acimret elibisoprosed e)DCM(acimihconaccem aigoloncet alled enoizarobale id Ãtinu id ocimret otnemibrosid id arugif id ipmesE)B(DCM)A(etneibma'llen SPOP e FDCP-DDCP itsopmoc id enoizisopmoced id ossecorp lI 88203 88203 :SWE IV IV otnemanasiroib li rep elategev aigoloncet al onazzilitu ehc otnemanoipmac id itis id ipmesE .itunetnoc ituifir ien enoizalocrep al ominim la errudir rep olousottos len atartne eresse opod auqcA .eranimile de eranimile de eranimile de eranimile de erednerp ,enoizartlifni'l erineverp rep anavoip auqca'l eraruttac id etnaip elled Ãticapac alled osu'l ,enoizaripsart alled ollortnoc li rep ilaicifrepus euqca o eenarrettos euqca id Ãtitnauq idnarg erettemsart e erineverp rep irebla id osu'l ,olous led eccafretnI e ecidar allen itnanimatnoc i erazzilarap rep etnaip elled etrap ad icimihc itsopmoc id enoizudorp al ¨Ã ehc ,noitazilibatsotyhpraka enoizes alled o enoizazzicalovotoollnalp id atnaip alled icidar ella onrotta onerret len itnaniuqni itsopmoc ied enoizadarged-oib id Ãticapac elled otnemua e enoisnapse :euges emoc otageips ¨Ã ocigoloncet omsinaccem lI .atolip atnaip al adraugir otnauq rep olos atappulivs ¨Ã is aigoloncet atseuq ,aronif aM .onerret len ehcna e eenarrettos euqca ellen itunetnoc itsopmoc pop i ereggurtsid onisrep o erazzilibats ,eradarged rep etnaip elled icidar ellus irettab azzilitu icinasiroib pop i rep acigoloncetotif aigoloncet aL .DNEMARAD id ounitnoc ossecorp li azzilitu onanasiroib ossecorp lad atautteffe onerret led enigammi'L .utis-xe de utis ni atazzilitu eresse ehcna ²Ãup aigoloncet atseuQ .inaruf e enissoid ,BCP itsopmoc ereggurtsid o erarobale rep otazzilitu eresse ²Ãup non am ,itnanimatnoc irtla e TDD ,BCH ,nefaxot idicitsep ad otanimatnoc olous led otnemanasiroib li rep atazzilitu etnemaipma atats ¨Ã aigoloncet atseuQ .olous led ecirtam allen)acissona(etrof otlom enoizidnoc anu errudorp

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