

Disposal of polymers essay sample

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Polymers are an essential material in today's society used in everything from clothing to engineering components. They provide an environmental problem when they are past their useful life. Many polymers that are finished with are normally disposed of wastefully. As we are using so many polymers we need to reuse them and dispose of them in an environmental way.

How different types of polymer may be disposed of One of the useful properties of polymers is that they are un-reactive, so they are suitable for storing food and chemicals safely. Unfortunately, this property makes it difficult to dispose of polymers. Most polymers are not biodegradable. This means that micro-organisms cannot break them down, so they may last for many years in rubbish dumps. It is difficult get rid of plastics, if you bury them in a landfill site, they'll still be there years later. Landfill sites fill up quickly and they are a waste of land. Soon there wont be any land to put them in.

Addition polymers are the type of polymer which cannot be broken down and biodegraded, due to very strong carbon-carbon or carbon-hydrogen bonds. Addition polymers are made by the combination of monomers which will not lose an atom during the process.

The reason that they do not degrade quickly is because the man made polymers are typically of a much longer chain length to keep their shape and have high boiling temperatures. The carbon-carbon bonds holding together the monomers are very strong, meaning it requires a lot of energy to break down these carbon bonds between the different parts of the polymer which are very stably held together.

Polymers have recycling symbols, many polymers can be recycled. This reduces the disposal problems and the amount of crude oil used. But the different polymers must be separated from each other first, and this can be difficult and expensive to do. This often involves melting down the plastics and combining them with other scraps of the same type of plastic to reshape them and wash them to be used again usually for the same job, although they can often be given a new shape and the chance to be used with other materials.

Polymers can be burnt or incinerated. This would create enough energy to destroy the carbon-carbon bonds and break down the long chains of monomers meaning that the polymer would not be left whole. They release a lot of heat energy when they burn and this can be used to heat homes or to generate electricity. There are problems with incineration. Carbon dioxide is produced, which adds to global warming. Toxic gases are produced unless the polymers are incinerated at high temperatures. Also some release gases such as acidic sulphur dioxide and poisonous hydrogen chloride and hydrogen cyanide.

What methods are employed in disposal?

The impact on society if they are not disposed of responsibly will mean that many harmful gases will be produced, will cause many environmental problems, lots of land will be wasted on burying plastics, plastics lasts for a long time. This means we need different methods to dispose of polymers.

Landfill sites: many polymers are simply placed into landfills; however these are not always biodegradable and can take hundreds of years to break down causing overfilling of landfills and damage to the natural environment and animals around it. However some are fully biodegradable and can be successfully broken down in the landfills quickly and sufficiently.

Recycling: scraps of used plastics are separated into groups of similar polymers and are shredded and melted down to be reshaped and reused in different shapes and jobs, causing a lot less damage to the environment and much fewer resources such as crude oil being wasted in producing endless amounts of new plastics for packaging food etc.

Combustion: polymers can be broken down through combustion which involves extremely large amounts of heat to reduce the number of toxic gases being produced however the oxidation does still produce a large amount of by product and CO₂ emissions which are very unpopular with the world at the minute. We know that toxic gases are produced, unless the polymers are incinerated at high temperatures.

Why these different methods are important?

Having these different methods is important as there are problems for each method of disposal and therefore we need an alternative for each. Also the more options we have the easier it is to dispose of polymers environmentally.

The problem with combustion is that it has very harmful by products and therefore is not very good environmentally and are extremely potent as the

large amount of toxic gases produced could lead to an increase in global warming in our planet. We can reduce the amount of gases produced by heating them at large temperatures and incarcerating the plastics in the right conditions and areas. However it is still important to know that we can rid ourselves of the plastics in the case of landfills overflowing.

The trouble with dumping polymers in landfills is that not all are biodegradable and therefore take a long amount of time to degrade, whereas the ones which are fully biodegradable are a lot quicker. This means the plastics will all eventually degrade in the end however in the mean time the landfills can overflow and cause damage to the surrounding area as plastics are often attempted to be eaten by animals or end up wrapped around trees. A lot of land will be wasted and soon there will be no more land to use so we need to dispose of them carefully. Despite this we know that they will eventually breakdown even if it takes an enormous amount of time.

Recycling is extremely important as it means we don't have to keep using large amount of the ever decreasing supplies of crude oil and money in the production of plastics and plastics products. However it does mean that we have to separate out our plastics into groups and it also means that the polymers aren't actually being disposed of, but we can find other harmless uses for them making it incredibly helpful. This is probably most environmentally friendly and so is likely to be most effective.

What is the impact on society if they are not disposed of responsibly?

If polymers are not disposed of responsibly it can cause massive damage to the natural environment around us. We will end up with a very big amount of polymers just being dumped and wasting space. Many plastics bags for example end up in the sea which can be wrapped around coral reefs, seabirds or fish and kill them off. Misusing polymers in this way has a devastating impact on our society as not only can they kill harmless creatures but it also means we are wasting the resources we have; as plastics come from crude oil.

We also spend a lot of money making more polymers so we could save a lot of money if we dispose of them properly and safely. This will not cause any hazards and we would have an effective system to lower the amount of polymers produced. We do not have endless supplies of oil and therefore we need to consider the way we dispose of our polymers seriously or we could end up doing more damage than we intend to.