The Recycling of Fiberglass in Wind Turbine Blades

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The increased use of wind turbines will inevitably lead to a large number of worn out rotor blades within about twenty years. Up to now, there is no solution yet to recycle or to re-use the materials from these wind turbines. This research aims for a solution of the increasing waste problem of wind turbines. The aim is to find a way for separating the fiberglass from polyester resin and MEKP hardener, in order to increase the possibilities for reusing the fiberglass and the other components. Solvolysis has been the base for various lab studies on both samples of selfmade polyester-glassfiber plate and real samples of rotor blades. The experiments were divided in two components. During the first experimental research different solvents where used to find the best basic results. Acetic acid with a catalyst of potassium hydroxide proved the best dissolving capacities. For the second experimental research, different concentrations of this combination were used in order to find the optimal mixture: between 5 and 10 percent of acetic acid in combination with potassium hydroxide gives the best result. The reobtained glassfiber has been obeserved through a microsope and no visible damage has been found. These released glass fibers have also been reused in new samples. Therefore it is possible to separate fiberglass form the other chemicals which are used in wind turbines. According to our research it is possible to recycle wind turbines and to make this world a better place.

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