CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The cat-litter was produced from phosphogypsum plaster(β-plaster), water and the adsorbent materials which are paper pulp and coconut coir pith. In this study, the amounts of added water in the production were varied in the following range; 40, 42.5, 45, 47.5, and 50 percent. The density of each sample was different due to the various percentage of added water in production. For the same added material, the density of the cat-litter was inversely proportional to the quantity of added water in production. In other words, the lower added water brought about the higher density.

The abrasion resistance was characterized via ASTM E 728-91 method. For this aspect, the abrasion resistance can be related to amounts of wore dust in the package of cat-litter or in the litter-box. According to the results, the abrasion resistance was directly proportional to the density of the obtained cat-litter. For different added material, the cat-litter with added paper pulp seemed to have a better abrasion resistance than the cat-litter with added coconut coir. This is because the length to diameter ratio of paper pulp is more than coconut coir's so paper pulp assists the cat-litter to have better strength. In other words, the paper pulp acts as reinforced fiber in the pellet of plaster. For coconut coir, its length is close to its diameter so it does not improve the strength of the obtained cat-litter. In addition, paper pulp is purified cellulose from plants so that paper pulp has more fiber composition than coconut coir which is a natural material.

The most important characteristic of the cat-litter is water adsorption capacity. A good cat-litter might adsorb water at high capacity. For the same added material, the results indicate that the water adsorption capacity was linearly and inversely proportional to their density. For different materials, the water adsorption capacity of the cat-litter with added paper pulp was a bit higher than the cat-litter with added coconut coir but their variations were proximal. Since the mass of plaster was 90 percent of the cat-litter, the water adsorption ability of the plaster portion dominated over paper pulp and coconut coir portions and this is why the two types of cat-litter had similar variation of water adsorption. There is no effect on the adsorption capacity of plaster and paper pulp when they are integrated. However, the adsorption capacity of plaster and coconut coir is decreased when they are combined into the cat-litter. The plaster arrangement and PVA

cross-linkage obstruct swelling of coconut coir then, coconut coir cannot freely swell. Then, the coconut coir does not reach the maximum capacity of water adsorption. Either in view of abrasion resistance or water adsorption, the cat-litter with added paper pulp is a better adsorbent than the cat-litter with added coconut coir. Although coconut coir is not a material which makes the-cat-litter a better adsorbent than paper pulp, coconut coir can reduce the cost of the cat-litter. This is because the coconut coir is 17.5 times cheaper than paper pulp, as shown in Appendix A.

5.2 Recommendations

- In the production, the plaster and coconut coir are strongly pressed by an extruder. The method of pelletization, which make plaster and coconut coir arrangement looser, will let coconut coir freely swell. Consequently, coconut coir may adsorb water in full capacity.

- Changing the binder, from PVA to the other binders with a weaker bond, lets coconut coir swell more freely.

- A good cat-litter should eliminate urine odor. Urea adsorption is the important property which is not performed in this work yet. In further study, urea adsorption ability should be tested.