Claims

1. An article of manufacture comprising:

a binder and a filler, the binder being cellulose nanofibrils, and the filler being deinking waste solids comprising ash and cellulose fines;

wherein the article is a fiber or a film, and the binder is impregnated with or encapsulates the deinking water solids to form the fiber or the film.

2. The article of Claim 1, wherein the filler is present in a range between 1 wt. % to 80 wt. % based on the total weight of the fiber.

3. The article of Claim 1, further comprising PVOH in a range between 20 wt. % to 99 wt. % based on the total weight of the fiber.

4. The article of Claim 1, wherein the cellulose nanofibrils are present in a range between 1 wt. % to 80 wt. % based on the total weight of the fiber.

5. The article of Claim 1, wherein the ash is precipitated calcium carbonate, ground calcium carbonate, gypsum, titanium dioxide, clay, silica, or any combination thereof.

6. The article of Claim 1, wherein the filler comprises particles having an average size of less than 20 micrometers in diameter.

7. The article of Claim 1, further comprising a processing aid.

8. The article of Claim 7, wherein the processing aid is present in a range between 0.5 wt. % to 10 wt. % based on the total weight of the fiber.

9. The article of Claim 7, wherein the processing aid is carboxymethylcellulose, starch, glyoxal, glutaraldehyde, dialdehydes boric acid carbonate, zirconium ammonium carbonate, glyoxalated polyacrylamide, polyamide-epichlorohydrin, polyamine-epichlorohydrin, urea-formaldehyde, melamine-formaldehyde, polyethyleneimine, propylene glycol, diethylene glycol, triethylene glycol, dipropylene glycol, glycerol, or any combination thereof.

10. A paper web comprising the article of Claim 1, wherein the article is the fiber.

11. A paper web comprising the article of Claim 1, wherein the paper web comprises a cellulosic substrate having a surface, and the article is substantially disposed onto the surface or impregnates the cellulosic substrate.

12. The paper web of Claim 11, wherein the article impregnates the cellulosic substrate and has a particle size with an average diameter in a range between 1 micrometer and 80 micrometers.

13. An article of manufacture comprising:

cellulose nanofibrils and a filler, the filler being deinking waste solids comprising ash and cellulose fines, and the cellulose nanofibrils being at least one of a nanofibrillated cellulose or a cellulose fibrid;

wherein the article is a fiber or a film, and the cellulose nanofibrils are impregnated with or encapsulate the filler.

14. The article of Claim 13, wherein the filler is present in a range between 5 wt. % to 50 wt. % based on the total weight of the fiber.

15. A method of making an article of manufacture, the method comprising:

impregnating or encapsulating a binder with a filler, the filler being deinking waste solids comprising ash and cellulose fines, and the binder being cellulose nanofibrils; and

preparing an extrudable dope;

wherein the article is a fiber or a film.

16. The method of Claim 15, further comprising wet spinning, dry spinning, shear spinning, or slit extruding the extrudable dope to form the fiber or the film.

17. The method of Claim 15, wherein the cellulose nanofibrils are at least one of a cellulose nanofibril or a cellulose fibrid.

18. The method of Claim 15, further comprising homogenizing wood pulp fibers or other fibrillatable cellulose to form the cellulose nanofibrils.