and the like include artificial grass and synthetic sport surfaces, woven and nonwoven fabrics, floor coverings, sacks, flexible intermediate bulk containers (FIBC), apparels, domestic uses, carpets, rugs, upholstery, agrotextiles, geotextiles, construction sheeting, filtration, ropes, twines, cordage, nets, wraps, bags, medical, hygiene, diapers, durable paper, wiping cloths, strapping, polymer-wood fibre composites, polymer-concrete reinforcement, thermal binder fibre in nonwoven composites, glass fibre composites for the preparation of masterbatches (colour, functional properties) for textile appplications and the like.

The resultant fibres, tapes and the like exhibit improved tensile properties expressed as the balance between tenacity and elongation at break. In particular it has been found that the melt index of the polymers may be increased to the benefit of the product processability while maintaining the balance between tenacity and elongation at break.

Summary

In one aspect, the present disclosure relates to a fibre, tape, filament or similar comprising a polyethylene composition comprising a copolymer of ethylene and a α-olefin prepared by polymerization in the presence of a single site catalyst system said copolymer having

(a) a density in the range 0.915 – 0.950 g/cm^3, and

(b) a melt index MI_2 (2.16 kg,190^{O}C) in the range 0.01 – 50 g/10 min

characterized in that said fibre, tape, filament or similar has a tenacity and elongation at break (%) wherein

(i) elongation (%) ≥ 21.4 x (tenacity)$^{-1.05}$

(ii) tenacity ≥ 0.16 N/Tex.

In another aspect, the present disclosure relates to an article comprising fibre, tape, filament or similar as defined herein.

Detailed Disclosure of Embodiments

Thus according to a first aspect of the present invention there is provided a tape, fibre filament or similar comprising a polyethylene composition comprises a copolymer of ethylene and an α-olefin said copolymer having

(a) a density in the range 0.900 – 0.970 g/cm^3, and

(b) a melt index MI_2 (2.16 kg,190^{O}C) in the range 0.7 – 50 g/10 min

characterized in that said fibre, tape, filament or similar has a tenacity, elongation at break (%) and melt index wherein

$$[\delta\log(\text{elongation})/\delta(\text{tenacity})] \geq M \times (\text{melt index}) + C$$

wherein M = - 0.45 and C = - 0.55

Preferably the polyethylene composition of the present invention has a unimodal molecular weight distribution.

Thus according to another aspect of the present invention there is provided a tape, fibre filament or similar comprising a polyethylene composition comprises a copolymer of ethylene and an α-olefin having a unimodal molecular weight distribution said copolymer having

(a) a density in the range 0.900 – 0.970 g/cm^3, and

(b) a melt index MI_2 (2.16 kg,190^{O}C) in the range 0.7 – 50 g/10 min

characterized in that said fibre, tape, filament or similar has a tenacity, elongation at break (%) and melt index wherein

$$[\delta\log(\text{elongation})/\delta(\text{tenacity})] \geq M \times (\text{melt index}) + C$$