addition, these semiconducting and metallic piezoresistors are costly to be fabricated and very sensitive to temperature. This issue lead to the development of development of stretchable conductor materials with high piezoresistivity which is commonly fabricated in the form of composite of conductive filler with the elastic polymer matrix (Trung and Lee, 2017).

In addition, the nanoscale material such as AgNWs, AgNPs, CuNWs and CNTs are used to fabricated stretchable electronic with ultrahigh piezoresistivity due to the chirality and change of barrier height (Amjadi *et al.*, 2016). However, there is a concern about the contribution of the piezoresistivity of these nanomaterials on the stretchable electronics may be low. It is because there is a problem about the compatibility of the elastic polymer with the nanomaterials. Poor compatibility of the piezoresistivity nanomaterials and elastic polymer may lead to poor interfacial adhesion and yield negligible deformations of the nanomaterials upon stretching.

2.6.2 Percolation Mechanism

The variation conductivity of nanocomposite is the result of the variation of conductive filler concentration. It is because the conductivity is governed by the percolation mechanism, also as known as percolation theory. The percolation theory can be expressed in:

$$\sigma \approx \sigma_o \ (p - p_c)^t, p > p_c \qquad \text{(Equation 2.1)}$$

Where σ is the bulk conductivity of the composite, σ_o is the conductivity of the filler, p is the weight percentage of the filler and is the critical exponent. The critical percentage p_c of filler is defined as the percolation threshold (Dang *et al.*, 2017). A continuous electrical pathway is built when the concentration of the conductive nanofillers has exceed the percolation threshold and achieve the critical fraction which is illustrated on Figure 2.8.