



## ABSTRACT

Burning of coal, wheat husk and rice husk in power generating plants producing large amount of ash waste. As energy demand is increasing their production rate is also increased. Their disposal cost is high and environmentally unsound. On the other hand, shortage of cement is also faced as it has become expensive due to excessive demand. Global warming and environmental problems associated with above mentioned sectors can only be solved by promoting eco- friendly products. This research tried to provide a solution by recycling by-product ashes in optimum amount in cement and concrete. This study investigates physical as well as chemical characteristics of coal fly ash, wheat fly ash and rice husk ash which are collected from various places of Pakistan. Modified concretes of 20% and 40% ash's compressive strength, rebound number and water absorption were also examined after 14, 21 and 28 days of curing under controlled conditions at laboratory and uncontrolled conditions at home. High silica quantity makes these ashes suitable for substitute of cement in construction purpose as they do not compromise on compressive strength. Results of tests performed on ashes depicted that coal fly ash has lowest fineness modulus =1.13 mm and L.O.I is also low 4.28 % among wheat fly ash and rice husk fly ash. Sulphur weight percentage of coal fly ash is 0.911 % and nitrogen is absent, these elements help concrete to gain strength without cracks appearance even after prolonged days of curing. As compare to 0% coal fly ash and 40% concrete replacement, 20% of cement replacement with coal fly ash also has highest compressive strength (48.88 MPa), rebound number (40) and lower water absorption rate (1.15 %) at controlled conditions (25 degree Celsius) after 28 days. Almost same trend has been observed at normal condition for 20% coal fly ash concrete highest compressive strength (34.9 MPa), rebound number (33.3) low water absorption (1.50%) after 28 days.