Operation Instruction

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1. Ash 0.2mm air dried coal samples completely according to proximate analysis standard. Then grind samples below 0.1mm with agate mortar.
2. Spread one or two grams of coal ash into a thin layer in a porcelain plate or glass plate. Moisten with several drops of dextrin solution. Use spatula to load and press moistened ash into ash mold and work it into a stiff mass. Remove the cones from cone mold with care and place cones on porcelain plate or glass plate. Make ash cone air-dried in air or dry at 60℃.
3. Mix dextrin solution with a little magnesium oxide into pasty mass and adhere cone on the triangular holes of cone tray. The side that ash cone is perpendicular to cone tray should be vertical to cone tray surface. After ash cone loading, remove unnecessary magnesium oxide with a pointed spatula.
4. Turn on power, heating power, determinator, printer and computer in sequence.
5. Start analysis software program. Click System Setting to check if parameters meet requirement with analysis requirement. Select analysis modes and turn on heating power. Click Start Analysis.
6. If envelop carbon mode is used for analysis, weigh five to six grams of graphite powder and activated carbon for each. Place graphite powder in combustion cup and cover with activated carbon.
7. If gas charging method is selected for analysis, turn on valve on gas cylinder and adjust reducing valve to 0.1MPa. When charging, adjust gas flow meter to 150ml/min approximately.

8. After sample feeding device descends and stops at required position, place cone tray loaded with ash cone on combustion cup. Input sample data on sample information dialog box. Then click Next, it starts to feed sample into high temperature furnace automatically. It displays analysis dialog box.
9. After sample feeding device goes up to required position, it starts temperature control and rotates analysis samples continuously. With temperature rise in furnace, furnace is lighted by heating elements (about 700℃). Check if ash cone falls down. If so, terminate analysis immediately. Restart analysis after cooling. When temperature is over 900℃, it starts to collect image. When all the predefined ash fusion temperatures (DT, ST, HT and FT) of ash cones are determined or furnace temperature is beyond maximum requested furnace temperature, analysis will be terminated automatically. It stops temperature control, analysis data saving and report printing automatically.
10. For more analysis, cool furnace temperature below 200℃.
11. After all analysis samples are finished, switch off printer, computer and heating switch of determinator but keep determinator power on to cool for another half an hour. After cooling, turn power off. If gas charging method is selected for analysis, turn off valve on gas cylinder immediately after analysis.

Note

1. Turn on determinator first and then start analysis software program. Turn on heating power. After analysis, exit from software program and turn off power source in case it damages 20A fuse.
2. If H2 and CO2 charging is selected, charge CO2 at 200℃ first and then charge H2 at 500℃ in case it explodes owing to wrong order. If mixed gas of CO and CO2 is selected, charge mixed gas over 600℃ in

case it causes carbon monoxide poisoning. Keep room with good ventilation.

3. If image is not clear, clean quartz lens and restart analysis. During analysis, adjust camera to locate ash cone bottom between two green lines. Ash cone is in the middle of 150 pixel vertically to ensure red contour line after image processing matches cone contour line.
4. When placing combustion cup, do not touch combustion tube. Try to keep center of combustion cup overlaps with that of combustion tube. Make sure cone tray is vertical.
5. In cone feeding, note if feeding device is pointed to central hole of high temperature furnace. If not, turn off analyzer immediately and terminate analysis. Then adjust cone feeding device to the right position in hardware debugging and restart analysis.
6. In weakly reducing atmosphere, check atmosphere in furnace regularly. Ash samples loaded in furnace can be standard ash sample. If deviation of ST, HT and FT between analysis results and standard value is not more than 50 ℃, it indicates atmosphere in furnace is weakly reducing atmosphere. The common and reliable way is to load standard ash sample when making analysis ash sample.