



CAL2K – APPLICATION NOTE

C1.6 ALTERNATIVE ENERGY SOURCE SAMPLE – P5 WOOD PFEIFER

INTRODUCTION

Many institutions are doing research and development on alternative energy source.

Alternative energy refers to energy sources, which are not based on the burning of fossil fuels or the splitting of atoms. The renewed interest in this field of study comes from the undesirable effects of pollution (as witnessed today) both from burning fossil fuels and from nuclear waste byproducts. Fortunately there are many means of harnessing energy, which have less damaging impacts on our environment.

Part of the research involves determining the calorific value (energy content) of the alternative energy source.

Institutions performing this type of research include:

- Universities
- Research Facilities
- Government or private industries

SAMPLE PREPARATION

Many samples once they have been ground into a powder will not easily press into tablets using a pellet press, because the fibres will not adhere to each other irrespective of the pressure exerted during the pelleting process.



An alternative method to ignite the sample without it splattering during the burning process is to place the powder (ground sample) inside a gelatine capsule. The capsule ignites easily thus causing the sample to ignite while confirming the sample during the ignition phase.

The calorific value of each batch of gelatine capsules must be determined. This value along with the mass of the capsule is used in the spike application of the CAL2k.

SPIKE METHOD

Turn spiking "ON" on the CAL2k. A selection of 10 capsules must be analysed as normal samples. From the 10 results an average calorific value for the gelatine capsules can be determined. This value is then used as the spike value in the CAL2k.

When doing a spike determination, follow this procedure:

1. Tare the balance
2. Place the capsule on the balance pan
3. Enter the mass of the capsule into the "Spike Moves" of the CAL2k.
4. Tare the balance again with the capsule on the pan.



5. Open the capsule and fill with sample, close the capsule, clean off excess sample on the outside and replace on balance pan.
6. Transfer (manually or automatically) the mass of the sample to the CAL2k.
7. **Please note: If the calorific value is very low (less than 10MJ/kg) then 2 or more capsules may be required per determination.**
8. Insert the capsule into the crucible, ensuring that the firing cotton touches the capsule.
9. Continue the determination in the normal manner.
10. After a determination inspect the inside of the vessel for any signs of splattering and also check the crucible for any un-burnt sample. If there are signs of either then discard the result.
11. The result displayed already has the energy value of the capsule removed from it.
12. After every determination clean the inside of the vessel and the crucible before starting the next determination.

RESULTS

P5 Wood Pfeifer Sample Whole / P4 ARA Fritzens Sample Crushed



	RESULT	MASS	SID	DATE	BN	INIT DRIFT	FIRING TEMP	AMBIENT TEMP	RS	FINAL TIME
Calibration	26.454	0.5079	433	28/07/2006	1	0.0015	18.8	20.5	OK	8.2
1	11.577	0.3157	434	28/07/2006	1	0.0000	18.7	20.9	OK	2.2
2	11.980	0.3158	435	28/07/2006	1	0.0006	19.0	21.7	OK	1.5
3	11.202	0.3065	436	28/07/2006	1	0.0005	19.7	22.1	OK	1.7
4	11.857	0.2923	437	28/07/2006	1	-0.0002	21.0	22.3	OK	1.5
5	11.743	0.2900	438	28/07/2006	1	-0.0012	23.8	22.6	OK	2.9
6	11.246	0.2893	440	28/07/2006	1	-0.0004	21.3	23.0	OK	2.4
7	11.358	0.2922	442	28/07/2006	1	0.0012	21.1	23.2	OK	1.1
8	11.514	0.2924	443	28/07/2006	1	0.0014	21.7	23.7	OK	1.0
Control	26.429	0.5105	444	28/07/2006	1	-0.0004	22.0	23.9	OK	2.3
Average MJ/Kg = 11.559										

CONCLUSION

The calorific value of almost any alternative energy source type can be determined. Calorific value analysis of this nature is one of many results required to determine the energy content of these substances.