Some unusual glazed sherds from Flaxengate, Lincoln.

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Two books I have consulted (Hodges 1972,29-30; Charleston 1968,45-6) on the subject of chinese ceramics both talk of some of the pottery of the Six Dynasties period (220-589 AD) and the Yüeh wares that developed from it as 'proto-porcelain'. These wares have a grey stoneware body with mottled olive to grey-green glazes which are described as feldspathic. I assume this is the type of ware represented by the two sherds from Flaxengate (AM Nos. 800727-8).

On the more technical side, the only reference I can find to feldspathic glazes is in Hodges (1964, 50) who says "Feldspars may be pulverised and used alone or as the main constituents of .... feldspathic glazes (which) tend to be hard glazes and are normally to be found on porcelain bodies." By a hard glaze I think he means one with a high melting point. Feldspars have fusing temperatures in the range 1140-1280°C (Rosenthal 1949, 70) depending on composition (see below) though this could be reduced a little by adding a flux of some sort. However they only become fluid enough to run at temperatures 100-200°C higher. Unless a glaze has a significantly lower melting point than the pottery to which it is applied, the whole vessel will vitrify, soften and deform during glazing. For this reason, feldspathic glazes can only be applied to high-firing bodies such as stonewares and porcelains.

The main problem is how to show, analytically, that a glaze is feldspathic. Feldspars are alkali alumina silicates, where the alkali can be soda, potash, lime or any mixture of these three oxides. The various feldspars are given different mineral names depending which alkali or combination of alkalis is the dominant one. Their melting points depend on which alkalis are present and in what proportions. The complication arises in that an ordinary alkali glaze will contain one or more of the alkalis, soda, potash or lime, together with some clay minerals which are mainly alumina silicates! The identification of an alkali glaze as being 'feldspathic' must therefore be rather tenuous if based on chemical analysis alone as any alkali glaze may contain varying amounts of soda, potash, lime, alumina and silica. The only properties that seem to mark out a glaze as feldspathic are its raw materials (mainly crushed feldspar) and its high melting point. There should be no unreacted mineral particles left in the glaze so the only way to demonstrate that a glaze is 'feldspathic' would seem to be by determining its softening point - a task I would rather not attempt on these two minute sherds.

It can be seen from the attached x-ray fluorescence traces that

potash (K), lime (Ca), silica (Si) and alumina (Al) are all present. (Soda is not detectable under the analytical conditions used.) The other elements present are the deliberate or accidental colourants in the glaze and the constituents of the underlying clay body. The elements detected have been underlined on the scales on the spectra. The peaks without labels are the corresponding β-peaks for the same elements.

Very similar signal intensities are detected for all the glaze-forming elements in the spectra for both the chinese sherds and the islamic sherd. They are all alkali glazes. It is interesting to note that where copper is present zinc is present too, suggesting that the copper was added in the form of brass.

In conclussion I can only suggest that the term 'feldspathic' as applied to glazes is used with caution; a better term might be 'high-firing' or just 'high-temperature' alkali glazes. The two chinese sherds are definitely alkali glazed. A more specific description is not possible on the basis of chemical analyses alone.

References

Charleston, R.J. (ed) (1968) World ceramics. Chartwell Books Inc, Secaucus N.J.

Hodges, H.W.M. (1964) Artifacts. John Baker, London.

Hodges, H.W.M. (1972) Pottery. Hamlyn, London.

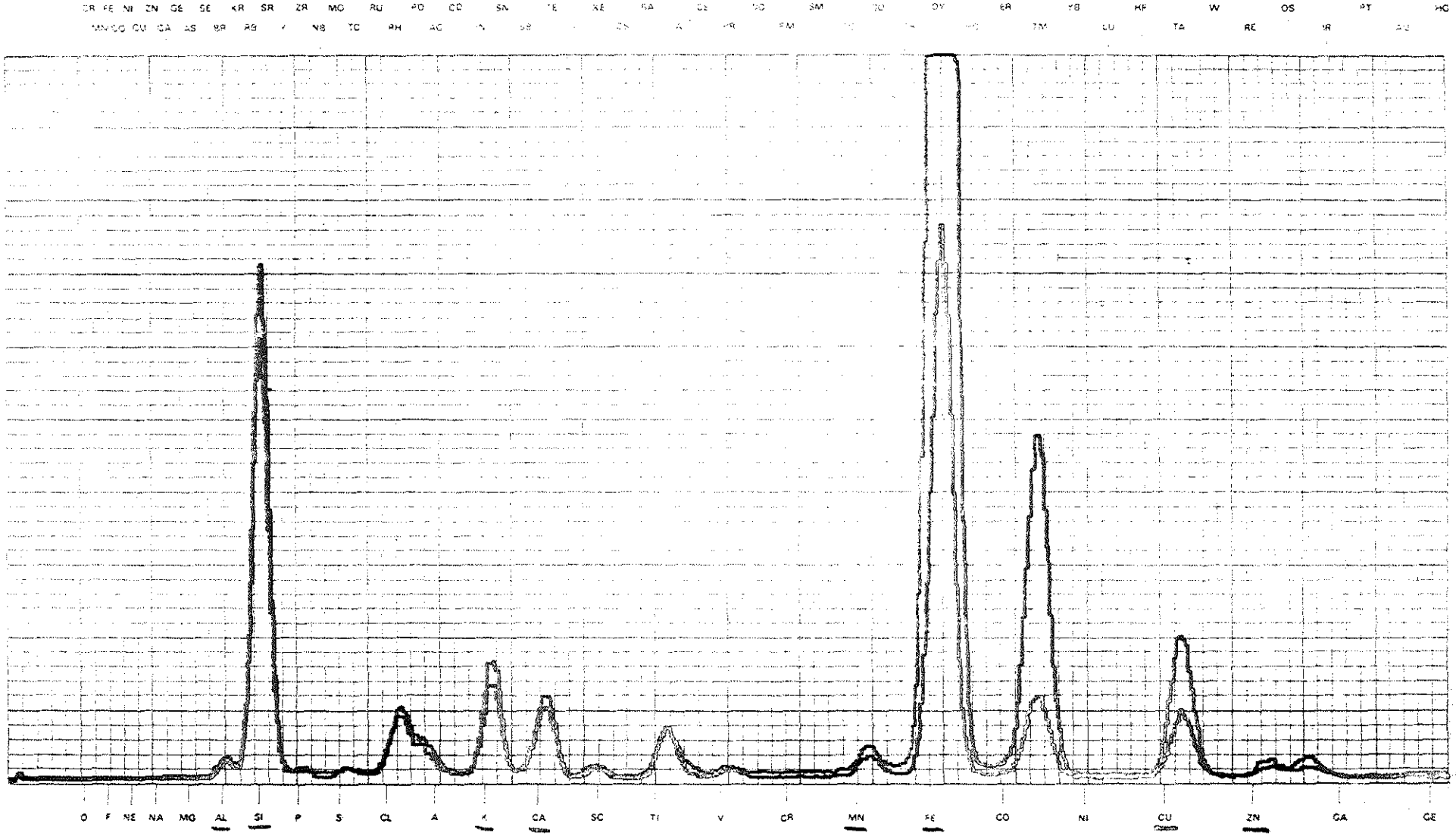
Rosenthal, E. (1949) Pottery and ceramics. Penguin, Harmonsworth.

Laboratory..... Researcher..... Date 22.8.80

Sample Lincoln, Blaxengate 800727 Black = Green side
Red = Black side

KeV 25 KeV 0.03mA Seconds 40 Take off Angle.....

L alpha lines



K alpha lines

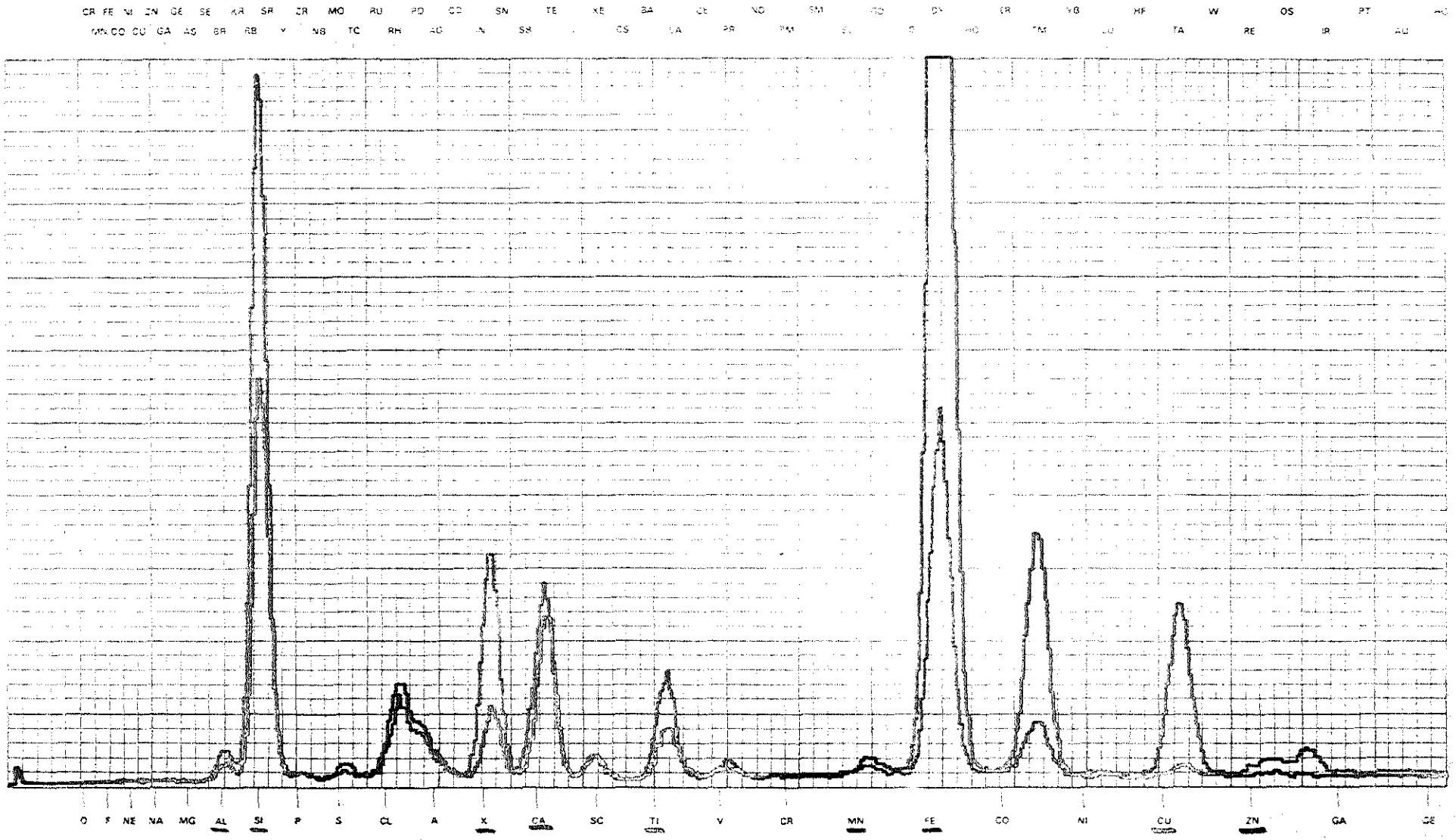
Link Systems Ltd X Ray Analysis

Laboratory..... Researcher..... Date 22.8.80.

Sample Linsh. Flaxengate 800728 Red = pale side. Black = dark side

KeV 25 kev 0·03m A Seconds 47 Take off Angle.....

L alpha lines



K alpha lines

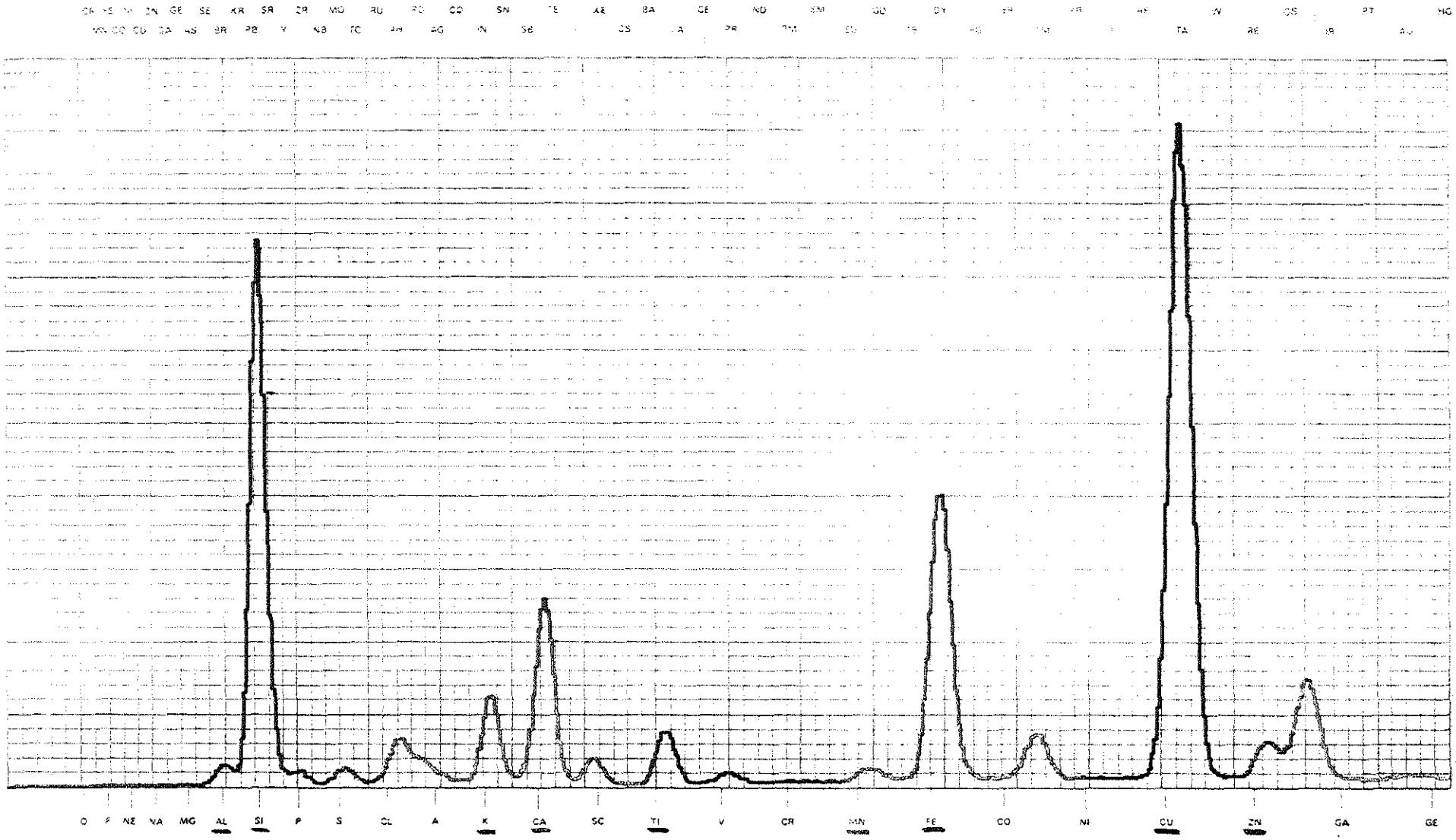
Link Systems Ltd X Ray Analysis

Laboratory..... Researcher..... Date 22.8.80

Sample Lincoln Flaxengate 790274? 'Islamic' glaze

KeV 25 Rdl 0.03mA Seconds 43 Take off Angle.....

L alpha lines



K alpha lines

Link Systems Ltd X Ray Analysis