that much of the input is integrated in such a way as to determine the probability of firing by certain limited sources or temporal patterns of impulses. Furthermore, the ratio of input to output impulses is probably very high and therefore insensitive to considerable fluctuations in absolute numbers of input impulses of the most active pathways.

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Thermal Decomposition of Rare Earth Fluoride Hydrates

Abstract. A thermogravimetric study of the thermal decomposition of La, Nd, Sm, Gd, Dy, Er, and Y fluoride hydrates shows that minimum dehydration temperatures are from 315° to 405°C; conversion of the fluorides to oxyfluorides begins in the 600° to 690°C temperature range.

As part of our investigations of the thermal decomposition of rare earth compounds (*1*), the pyrolysis of the rare earth fluoride hydrates was studied. The dehydration of these compounds is of interest at the present time because the anhydrous fluorides are used to prepare the rare earth metals.

Popov and Knudsen (*2*) previously studied the isothermal decomposition of the anhydrous rare earth fluorides and found that the pyrolysis took place in two steps. The first step was the conversion to the metal oxyfluoride; this was followed by the second step, the conversion of the oxyfluoride to the metal oxide. To our knowledge, the dehydration of the hydrated metal fluorides has not been described, and it is the subject of this report.

The rare earth fluorides were prepared by precipitation of the metal ions with aqueous hydrogen fluoride. The precipitated metal fluorides were filtered off through filter paper, washed with water, and air-dried for 24 hours at room temperature. Under these conditions, the metal fluorides corresponded approximately to the ½- or 1- forms of the hydrates.

An automatic recording thermobalance, previously described (*3*), was used to obtain the thermolysis curves. The samples ranged in weight from 90 to 100 mg and were run in duplicate or triplicate. A furnace heating rate of 5.4°C per minute was employed.

The thermograms of the rare earth fluoride hydrates are given in Fig. 1. From these curves and from previous studies (*2*), the following general pyrolysis pattern is presumed to take place:

$$MF_3 \cdot (\tfrac{1}{2} \text{ or } 1)H_2O \rightarrow MF_3 \rightarrow MOF$$

All of the compounds began to evolve water of hydration in the 40° to 60°C temperature range. However, horizontal weight levels corresponding to those of the anhydrous metal fluorides were obtained only for neodymium, samarium, and gadolinium. All of the other metal fluorides lost weight continuously throughout the entire thermogram.

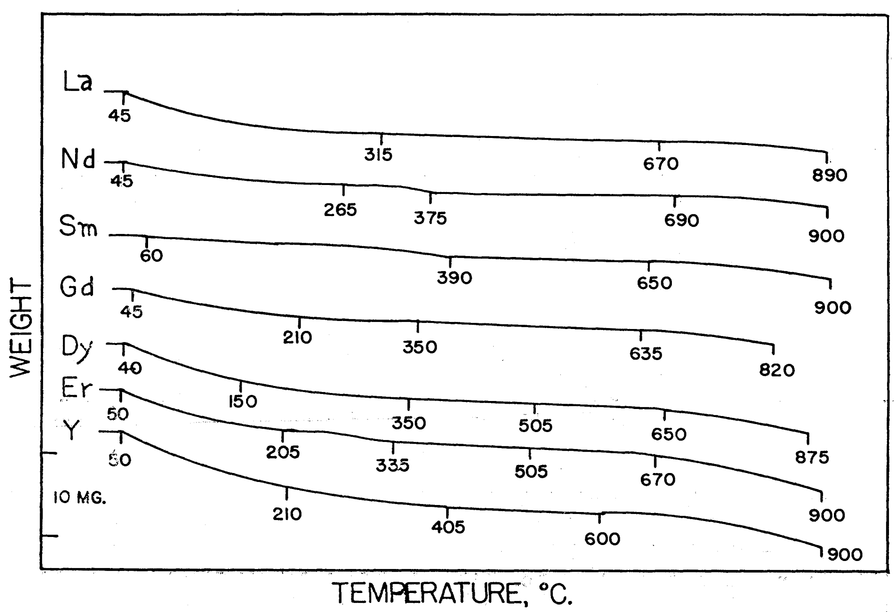

Fig. 1. Thermograms of the rare earth fluoride hydrates.

The pyrolysis of the metal fluorides to the oxyfluorides began in the 600° to 690°C temperature range. The rates of pyrolysis were quite slow and did not result in the metal oxyfluoride weight levels even at 900°C. Since the upper limit of the thermobalance furnace is 900°C, the pyrolysis could not be extended to higher temperatures.

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Transient Memory in Albino Rats

Abstract. Rats were trained on the repeated reversal of a position habit in a T-maze. Test trials of memory were given at varying intervals after the completion of each reversal. Those animals exhibiting a consistent preference for one side failed to retain the effects of training to the nonpreferred side for more than a few minutes.

Boycott and Young (*1*) have demonstrated the possible existence of reverberatory circuits mediating a discrimination habit in brain-damaged octopuses. The animals were preoperatively trained to attack a crab but to withhold the attacking response when the crab was presented along with a white card. If a response was made to the latter condition, the octopus was punished with an electric shock. Damage to certain parts of the brain eliminated the habit. The octopus attacked the crab under both conditions when trials were spaced by 2 or more hours. If, however, one negative trial (white card presentation) succeeded another within 5 minutes, the animal, correctly, withheld the response. Apparently the preceding negative trial had set up some short-term activity within a neural system corresponding to a memory trace of that trial which accounted for the absence of a response to the crab a few minutes later. The subsidence of this neural activity would explain the reappearance of the attacking response after an interval of 2 hours.

The present experiment reveals a similar transient memory in albino rats, but under a different set of conditions. Normal rats and rats subjected to either cortical or subcortical damage were trained on a simple water T-maze. Prior