yellow, hard crystal aggregates. Yield: 65 %. The acid was recrystallized from a small amount of ethyl acetate. M. p. 156—157° C with decomposition.

$C_8H_8O_4S$

	Equiv. wt.	C	H	S
Calc.	100.1	47.99	4.03	16.01
Found	100.6	48.05	4.08	16.08

A grant from the Nobel Fund of Chemistry (*Kemiska prisgruppens särskilda fond*) is gratefully acknowledged.

1. Pettersson, K. *Acta Chem. Scand.* **4** (1950) 395.
2. Fredga, A., and Pettersson, K. *Acta Chem. Scand.* **4**. In print.
3. Schaum, K., Schaeling, K., and Klausing, F. *Ann.* **411** (1916) 193.

Received October 19, 1950.

A Spraying Reagent for Paper Chromatograms Which is Apparently Specific for Ketoheptoses

ROLF KLEVSTRAND and ARNOLD NORDAL

Department of Pharmacognosy, Pharmaceutical Institute of the University, Oslo, Norway

Pentoses, glucuronic acid and certain heptoses are known to give a bluish green colour with Bial's reagent (orcinol dissolved in hydrochloric acid, to which $FeCl_3$ is added as catalyst [1]). Attempts to use this reagent for the detection of ketoheptoses (sedoheptulose and D-mannoheptulose) on paper chromatograms were unsuccessful, as the mineral acid attacked the paper. By using trichloroacetic acid instead of hydrochloric acid, however, we obtained serviceable results. When an aqueous solution of orcinol and trichloroacetic acid was used the resulting spots were diffuse as the sugars migrate from wet to dry regions on the filter paper [2]. If on the other hand, the reagents are dissolved in water-saturated *n*-butanol [2], well-defined spots are obtained. After a number of experiments we have arrived at the following reagent:

Orcinol	0.5 g
Trichloroacetic acid	15 »
n-Butanol (water-saturated)	100 ml

Owing to rapid esterification the reagent it rather instable. It ougth to be kept in a cold place and not to be used for more than 6—8 days after preparation.

After the paper has been dried, it is sprayed with the reagent and heated at 105° C for 15—20 minutes.

Table 1 shows how the various sugars behave under this treatment. For carrying out the reaction we used about 0.1 mg of each sugar.

As we have not had any aldoheptoses at our disposal, we have not yet tested whether the reagent gives any colour with these. Of the sugars we have tested it is, however, only the ketoses which react. The two heptoses which have hitherto been found in Nature are both ketoheptoses.

Table 1.

Sugar	Colour produced in the reaction
Sedoheptulose	Bluish green
Mannoheptulose	» »
Fructose	Yellow
Sucrose	»
Glucose	No colour
Galactose	» »
Arabinose	» »
Xylose	» »
Ribose	» »
Rhamnose	» »
Glucuronic acid	» »

The reagent is useful for, *inter alia*, paper chromatographic studies of the distribution of ketoheptoses in the vegetable kingdom, a research in which we ourselves are at present engaged.

1. Bial, M. *Deut. med. Woch. schr.* **28** (1902) 253.
2. Partridge, S. M. *Nature* **164** (1949) 443.

Received November 1, 1950.