

Oil or compound.	Resorcin solution.	Phloroglucin solution.
Cinnamic Aldehyde	Carmine-red color, later a red precipitate	Red color, later a deep red precipitate
Furfural	Yellow color, changing to a black precipitate	Same as resorcin
Formaldehyde	White precipitate, changing to old rose color and precipitate	Orange-colored precipitate
Paraldehyde	Cream-colored precipitate	Yellowish brown precipitate
Acetaldehyde	Cream-colored precipitate changing to dirty brown	Yellowish brown precipitate changing to dark brown
Oil of Citronella	Faint yellow color, finally white opalescence	Light red color, later a light red precipitate
Oil of Geranium	White opalescence	White opalescence
Benzaldehyde	White precipitate	Orange-yellow precipitate changing to light violet
Vanillin	Faint pink color developed after thirty minutes	Brownish red color after five minutes, precipitate formed
Butyraldehyde	White precipitate	Tan precipitate
Heliotropin	Negative	Red color, later a blood-red precipitate
<i>p</i> -Dimethylamino-benzaldehyde	Negative	Red color fading to a white precipitate
Eugenol	Negative	Pink color formed after a few minutes
Chloral Hydrate	Negative	Negative
Camphor	Negative	Negative
Salicin	Negative	Negative

It will be seen by an examination of the foregoing table that the tests are characteristic for all of the aldehydes, except butyric. The reactions are especially good for all of the aromatic aldehydes tried and could be used to identify any of them in mixtures. Cinnamic aldehyde can be detected by these reactions in such diverse substances as oils of cassia and cinnamon. This compound can be detected easily by means of the above reagents if present to the extent of 4% or better in the oil under examination, and when less is present, it can be detected if the test is allowed to stand a long time. This was ascertained by adding known amounts of cinnamic aldehyde to oil of turpentine. The latter oil alone gives negative results with the resorcin and phloroglucin solutions.

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## CHEMICAL EXAMINATION OF CEANOTHUS VELUTINUS.

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Being quite fairly wide-spread throughout eastern and western Washington, the sticky laurel has frequently attracted attention of the scientist as well as of the layman because of the waxy exudate and because of the strong odor at certain seasons. We have had occasion to experiment with portions of the plant during the past year and wish to report here the results of our preliminary examination. The work is to be continued and the complete report submitted later.

The material was identified by Prof. G. B. Rigg of the department of botany, University of Washington, as from *Ceanothus velutinus*, Rhamnaceae, commonly called Mountain Balm, Sticky Laurel, or Skunk Wood. The plant grows on very poor soil, usually on gravelly hills in dry spots. It is often associated with madrona. The leaves examined were collected about two miles from Silverdale, Washington, at the beginning of April 1922. Microscopical observations showed no stomates on the upper surface of the leaves but many on the lower. The epidermal cell walls were very thick and straight. The upper surface, but not the lower, was coated with a thick, sticky material, which dissolved readily in ether but was found to be insoluble in petroleum benzin. The leaves were dried in the air, then ground and submitted to a partial proximate analysis. Petroleum ether extracted 8.18% and ether dissolved from the residue 7.31% of the sample, the total extract being, therefore, 15.49%. The ash amounted to 3.75%.

The whole amount of the material at hand was then subjected to steam distillation, a very small amount of a dark brown oil separating from the product. The latter was thoroughly extracted with ether and the solvent removed by distillation. In this way we obtained a total yield of the brown oil equal to 0.1% of the fresh leaves. This oil had a specific gravity of 1.0157, an index of refraction 1.5315 and a boiling point about 218° C. Some decomposition took place at this temperature. The dark color prevented an accurate determination of the optical rotation but the examination indicated that the oil was inactive. The odor suggested the presence of cinnamic aldehyde, and possibly of eugenol, as did also a comparison of the physical constants.

	Sp. gr., 25° C	$n_{D_{20}}$	B. p.	$[\alpha]_D$
Oil of <i>Ceanothus velutinus</i>	1.0157	1.5315	218° C.	0
Oil of Cassia U. S. P.	1.045-1.063	.....	.....	-1 to +1
Cinnamic Aldehyde	1.054-1.058	1.6195	252	0
Eugenol	1.064-1.070	1.5400	250-255	0

Using a cassia flask, it was found that 20% of the oil dissolved in water, 15% in sodium bisulphite solution and 55% in dilute potassium hydroxide solution, the latter figures corresponding to the amounts of cinnamic aldehyde and eugenol, respectively. The amount of oil available was not sufficient to separate and absolutely identify either of these substances, but all indications point to the correctness of our suggestion that cinnamic aldehyde, at least, is present. As a partial substantiation of this, it might be noted that the oil responded to the resorcinol test for cinnamic aldehyde as described in another paper.<sup>1</sup>

Up to the present time cinnamic aldehyde has been found mostly in plants of the Lauraceae. Quite rarely does it occur in other natural orders and then only in very small quantities.<sup>2</sup> The probable amount in the oil from *Ceanothus velutinus*, as above noted, is about 15%. This would suggest the possibility of using the oil commercially as a flavor and for pharmaceutical purposes.

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<sup>1</sup> THIS JOURNAL, p. 418.

<sup>2</sup> Semmler, "Die Aetherischen Oele," Vol. IV, p. 225.