



Application Note AN-R-029

# Oxidation stability of cosmetic and pharmaceutical raw materials

## Fast and extensive determination without sample preparation

Raw materials used for manufacturing pharmaceutical and cosmetic products tend to oxidize. The demands on the quality of these goods are growing worldwide. Customers and producers want the highest quality in terms of manufacturing, processing, and of course origin. Therefore, producers need to know which raw materials meet these requirements. Furthermore, organic products play an increasingly important role.

Using the Rancimat method, the oxidation stability of cosmetic and pharmaceutical raw

materials can be determined quickly and reliably. The sample is analyzed without any preparation, and the induction time can be related directly to the oxidation stability of the sample.

This Application Note demonstrates the feasibility of the Rancimat method. Using the 892 Professional Rancimat, reproducible and accurate determination of the oxidation stability of different raw materials used for the production of cosmetic oils is possible.

## SAMPLE AND SAMPLE PREPARATION

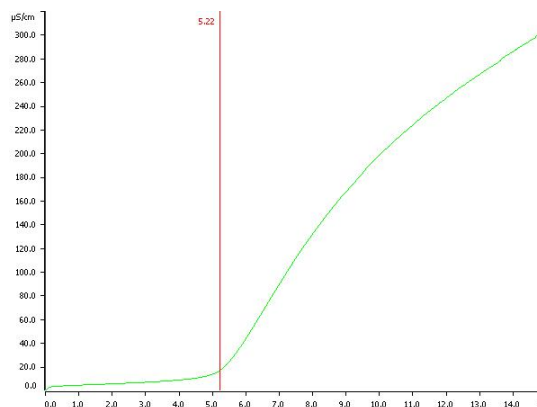
All natural oils were measured directly with the Rancimat. In this application note, only a small

selection is shown. On request, the determination database can be obtained.

## EXPERIMENTAL

For analysis, an appropriate amount of the raw material is weighed into the reaction vessel and the analysis is started.

With the Rancimat method, the sample is exposed to an airflow at a constant temperature between 100–180 ° C. Highly volatile secondary oxidation products are transferred into the measuring vessel with the airflow, where they are absorbed in the measuring solution. Here, the conductivity is continuously registered. The secondary oxidation products lead to an increase in the conductivity. The time until occurrence of this marked conductivity increase is referred to as the «induction time», which is a good indicator for the oxidation stability.



**Figure 1.** Determination of the oxidation stability of refined mango butter. Induction time is determined at 5.22 h.

**Table 1.** Results of the oxidation stability of a selection of different raw materials with the 892 Professional Rancimat. Four-fold determinations were carried out for each oil type.

Analyte (n = 4)	Mean value (h)	SD(abs) (h)	SD(rel) (%)
Almond oil, cold-pressed, org. and demeter	2.64	0.06	2.2
Argan oil, deodorized, org.	5.56	0.10	1.7
Cashew oil, CO <sub>2</sub> extraction, org.	6.55	0.18	2.8
Coconut oil, org.	76.05	0.79	1.0
Mango butter, refined	11.15	0.22	1.9

## RESULTS

Here, you will find only a small selection of cosmetic oils that were tested. **For the complete list of tested oils (> 50) please ask your local**

**Metrohm sales representative.** Overall, the demonstrated method delivers acceptable values for all samples with SD(rel) 10%.

## CONCLUSION

Most natural oils for the cosmetics industry can be measured directly with the Rancimat for their oxidation stability. In order to guarantee a constant high quality of the finished product,

high quality of the raw product is essential. With the Rancimat you can determine this parameter easily and simultaneously on eight different positions.

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## CONFIGURATION



### 892 Professional Rancimat

892 プロフェッショナルランシマツトは、長年世界で使われているランシマツトメソツトによって自然の油脂および油の酸化安定性を簡単かつ安全に測定するための分析システムです。加熱ブロック2つに8つの測定ホシジョンがあります。内蔵式ディスプレイには装置およびそれぞれの個々の測定ホシジョンのステータスが表示されます。各測定ホシジョンのスタートキーによって装置の測定をスタートできます。洗浄にかかる手間およびコストは、実用的である使い捨て反応容器および洗浄機に耐えられる付属品の使用によって最小限に抑えることかてきます。これによって時間とコストを削減し、精度と再現性を著しく改善することかてきます。測定実施のために必要な全ての付属品は同梱されています。装置の制御、データの記録、評価、保存のためには、StabNetソフトウェアが必要です。