

## Celite® Analytical Filter Aid (CAFA II)...Solving complex matrix analysis problems

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Analytical chemists encounter a wide variety of sample matrices, from relatively simple to highly complex. Examples of difficult matrices include bacterial lysates, biological fluids, vegetable extracts, fruit juices with pulp and other matrices. Generally, the most challenging situations are when the solids content is greater than 1% or when the solids themselves are compressible. Recovery of analytes of interest from these matrices is often very low and variable.

While standard filtration can sufficiently clean up some samples, with complex matrices it is difficult to recover sufficient volume of filtered sample for analysis. Filtration aids made from diatomaceous earth are frequently employed to facilitate the separation of analytes from matrix particulates. Celite® brand diatomite filter aids, manufactured by Advanced Minerals Corporation, are widely utilized in these instances. Celite® filtration aids are employed primarily to serve these two functions:

- **As a dynamic depth filter. This involves suspending the filter aid in the sample matrix prior to filtration. The Celite® diatomites co-migrate with the compressible solids during the filtration process. The rigid and porous diatomite particles act as a pseudo-skeleton, preventing the compressible solids in the sample matrix from forming an impermeable mass.**

- **As a conventional depth filter. Here the Celite® diatomite is simply laid down as a layer in a Büchner funnel prior to filtration. The bed height is typically 3 to 50 mm.**

Supelco division of Sigma-Aldrich has been supplying Celite® materials, including Celite® Analytical Filter Aid (CAFA), to our customers for many years. Recently, Advanced Minerals replaced CAFA with CAFA II, a more highly purified grade of Celite® for analytical and purification applications where filtrate purity is important. The CAFA II manufacturing process was designed to minimize the amount of contaminants that might interfere with the analysis. The physical and chemical properties of CAFA and CAFA II are compared in **table 1 and 2**. Supelco/Sigma-Aldrich is now the sole supplier of research quantities of CAFA II for research and laboratory applications.

Besides CAFA II, other Celite® materials available from Sigma-Aldrich include:

- Celite® 500
- Celite® 501
- Celite® 503
- Celite® 512 Medium
- Celite® 535 Coarse
- Celite® 545 AW Reagent Grade
- Celite® 545 AW Coarse
- Celite® 545 Coarse
- Celite® 577 Fine
- Celite® R566
- Celite® R630

**Table 1: Physical Properties**

Property	Celite Analytical Filter Aid II (CAFA II)	Celite Analytical Filter Aid (CAFA)
Wet centrifuge density, g/L	240	335
Permeability, D'Arcy	0.2	0.24
150-mesh sieve (105 µm) retains, %	10	3
Median particle size, microns	15	15
Median pore size, microns	3	3.5
Surface area (N <sub>2</sub> ), m <sup>2</sup> /g	5.1	6

**Table 2: Chemical Properties**

Property	CAFA II	CAFA
pH, 10% slurry	5.7	6.6
Acid soluble iron, mg/kg	4	60
Citric Acid/methanol soluble Aluminum, mg/kg	3.5	13
Conductivity, µS/cm	7	30
Acid soluble arsenic, mg/kg	0.5	ND
Acid soluble lead, mg/kg	0.1	0.5
Acid soluble substances, %	0.2	0.5
Ignition loss, %	0.1	0.5
Moisture, %	0.15	0.5

**Table 3: Ordering Information**

Cat. No	Brand	Description	Package size
11484-U	Supelco	Celite® Analytical Filter Aid II (CAFA II)	100 g
11485-U	Supelco	Celite® Analytical Filter Aid II (CAFA II)	500 g
11486-U	Supelco	Celite® Analytical Filter Aid II (CAFA II)	1 kg
11487-U	Supelco	Celite® Analytical Filter Aid II (CAFA II)	15 kg