

## Setting New Standards For Resolution, Speed and Versatility

### Instrument Components

- Solid State 15kV power supply.
- Set of EMP cells with platinum electrodes and mating adapters suitable for use with various substrates including filter papers, membranes, thin layer and gels.
- Integrated computer system with digital EMP control functions. Control software provides continuous graphic display of both voltage and current and can operate the instrument in constant current, constant voltage, or free-running mode.
- Independent analogue instrumentation control functions.
- High resolution video camera and digital image analysis software.
- Long wave ultraviolet illumination for fluorescent visualization.
- Flat-panel color monitor.
- Instrument user manual and warranty.

### Instrument Specifications

- Current 110 - 115 V, 60 HZ (US Model)  
220 - 240 V, 50 HZ (International Model)
- Width: 16.5 in (41.9 cm)
- Height: 8.0 in (20.3 cm)
- Depth: 16.5 in (41.9 cm)
- Weight: 49 lbs (107.8 kg)

### Computer Specifications

- 1.8 GHz Pentium Processor
- 40 GB Hard Drive
- 512 MB Ram
- CD - RW
- Windows XP Pro



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**HABER INC.**

EMP-15 D/A  
Patents Pending

# ElectroMolecularPropulsion™

Setting New Standards For Resolution, Speed and Versatility

**EMP**™  
ElectroMolecularPropulsion  
INFINITE POSSIBILITIES™

## Blazingly Fast Separation Analysis with Resolutions Crisp Enough to Support Quantitation

The newly developed EMP-15 D/A\* routinely delivers electrokinetic migrations of molecular species that take just seconds and only require movements of a few centimeters or less. (For example, the EMP™ technology can carry out protein separations in as little as 15 seconds.) The combination of speed, minimal separation distance and reduced electrical field strengths (which limits heat generation) greatly decreases diffusion and band broadening. This level of performance in combination with precision and reproducibility makes EMP™ a new mode of separation offering highly-refined molecular analysis.

### Versatile

EMP is effective with broad classes of molecules - including polar and covalent types - making it a general method of wide applicability. Well suited for high-speed analysis, it offers particular advantages when dealing with complex mixtures that are traditionally difficult to separate. The EMP-15 D/A is compatible with different substrates (filter paper, thin layer, membrane and gels) and can handle a wide variety of organic solvents. The standard cell can simultaneously run multiple samples in sizes ranging down to the limits of detectability.

\* Patents Pending

## Cutting Edge

The EMP technology portends new insights and vistas into molecular structures and their interactions. With company support and the development strategies laid out in the primer that accompanies the EMP-15 D/A, scientists can formulate their own analytical media. Application protocols for a variety of chemical types have already been developed for use with the instrument. To date, EMP has reliably analyzed chemical species including complex molecules such as proteins, tannins and polypeptides.

## Cost-Effective and Easy to Use

Requiring very little solvent (typically no more than one or two ml.), analysis with the EMP-15 D/A is not only cost-effective up front, but also minimizes the expense and troubles associated with waste disposal. With remarkably quick separations and normal setup times of a minute or less, the instrument provides an analytical procedure that is both efficient and user-friendly. Furnished with a fully-integrated computer system, image analysis software and a custom instrument control program, the EMP-15 D/A is a complete turnkey analytic system.

## Instrument Highlights

### Ultra-Fast

:: separations in minutes and even seconds

### High Resolution

:: sharp bands resulting from highly efficient separations

### Versatile

:: works with a wide range of solvents and substrates  
:: can handle many types of compounds including water insoluble organics  
:: does not require ionic polarity  
:: enables the development of novel custom analytical protocols

### Full Digital Controls

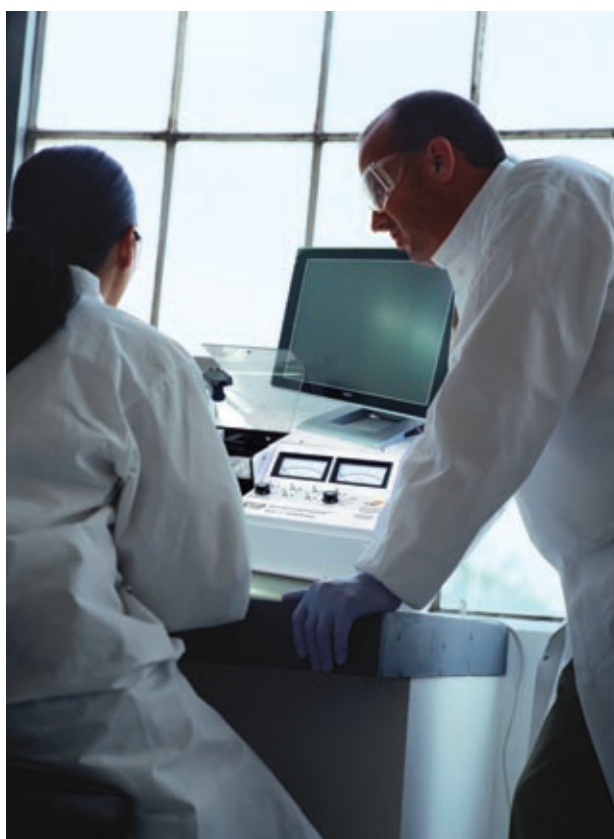
:: integrated computer, flat screen monitor and camera  
:: user-friendly instrument control software  
:: digitized image and data analysis software

### Easy to Operate

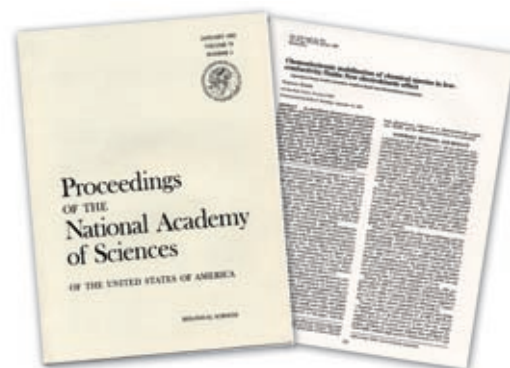
:: efficient ergonomic design  
:: can handle multiple samples simultaneously  
:: no equilibration delay  
:: ships with user guide and strategies for developing custom protocols.

### Cost Effective

:: reduced solvent volumes minimize analysis and disposal expenses

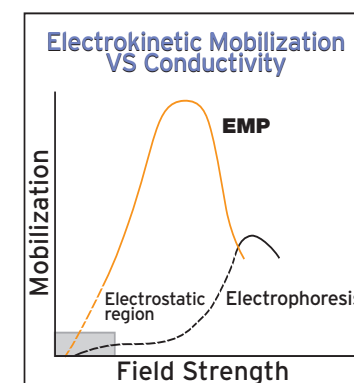


ElectroMolecularPropulsion™ is based on charge transfer principles emerging from chemical physics. Developed by Norman Haber, the EMP technology effects electrokinetic responses in molecular samples by making use of a controlled electrical field. The EMP-15 D/A is the world's only operational device which can strategically utilize, control and explore these unique electromolecular effects.

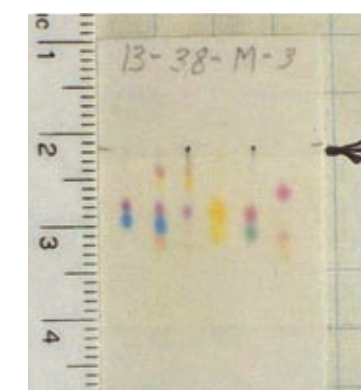


Norman Haber - Published in the Proceedings of the National Academy of Science. USA Vol. 79, pp. 272-276, January 1982

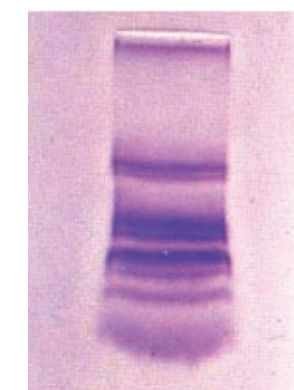
“Chemolectronic mobilization of chemical species in low-conductivity fluids: New electrokinetic effect.”



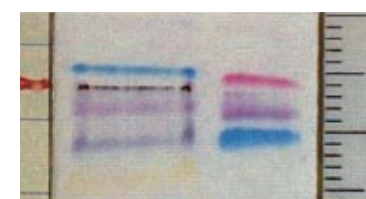
3 minute EMP ANALYSIS of commercial hydrophobic dye mixture. (scale: 1.3x)



EMP analysis of certified biological stains showing contamination. Performed with organic solvents in a few minutes. (scale: 1.3x)



90 second EMP SEPARATION of diverse protein mixture using modified agarose gel. Proteins include: bovine hemoglobin, whale myoglobin, horse heart cytochrome-C, bovine albumin, egg albumin, bovine milk  $\alpha$ -lactoglobulin, bovine pancreas  $\beta$ -chymotrypsinogen and chicken egg lysozyme. (scale: 1.3x)



EMP BIPOLAR SEPARATION of 2 hydrophobic dyes in less than one centimeter and 4 minutes. (scale: 1.4x)



2 minute EMP SEPARATION of  $\alpha$ -,  $\beta$ -lactoglobulin on modified agarose gel.