CLEAN SCREEN® Copolymeric Bonded Phases for Drug Abuse Testing

Analytical demand for more efficient, robust and clean extraction of drugs from biological matrices led to the development of CLEAN SCREEN® sorbents. Since 1986, CLEAN SCREEN® has led the industry with dependable and reproducible Solid Phase Extraction products and applications. CLEAN SCREEN® phases are true copolymeric sorbents that contain hydrophobic and ion exchange functional groups uniquely polymerized to a silica substrate. The design and quality of CLEAN SCREEN® provides superior sample clean up, recovery and reproducibility.

Mixed mode separations allow maximum selectivity for extraction of acids, neutrals and bases. This selectivity makes CLEAN SCREEN® ideal for both screening and confirmation analysis for virtually all drug categories. CLEAN SCREEN® DAU and THC columns are used extensively by forensic and clinical chemists including:

- Post Mortem Investigation
- Criminal Investigations
- Urine Drug Testing
- Athletic Drug Testing
- Racing Laboratories
- Therapeutic Drug Monitoring
- Medical Drug Screening

Note:

If performing extractions out of viscous matrices such as tissue or horse urine, turn to our XtrackT® section, where high-flow/gravity flow columns are found. The DAU CLEAN SCREEN® sorbent as well as other phases are available in this larger particle size.

Mechanism of CLEAN SCREEN®

When a sample is loaded onto the column at pH 6, many carboxylic acid functionalities present in the sample are ionized. This creates a repulsion between the column and many sample borne interferences, thereby reducing the likelihood of their adsorbing onto the column. At this pH, ibuprofen & barbiturates are not ionized and are hydrophobically adsorbed onto the column (figure 1). At the same time, drugs with amine functionalities such as cocaine and phencyclidine adsorb onto the column via both hydrophobic and ionic attraction (figure 1).

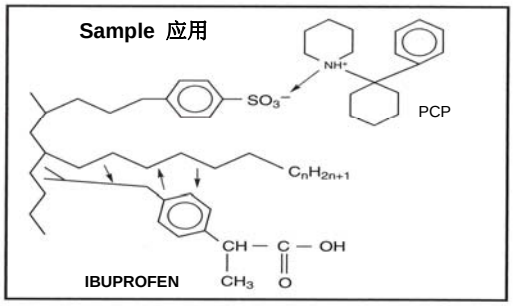


Figure 1

The column can then be washed with water or weak aqueous buffers at or below pH 6 without risking loss of the analytes. After drying the column, it is possible to elute the hydrophobically bound analytes using solvents of minimal polarity such as methylene chloride or a hexane/ethyl acetate mixture (figure 2). Cationic analytes will remain bound to the column. Many compounds of intermediate polarity and potential interferences will also remain on the column. The majority of these potential interferences can be removed by using a methanol wash.

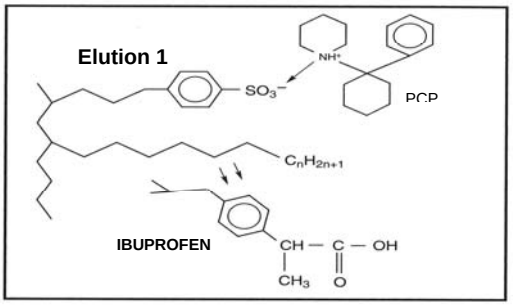


Figure 2

Cationic analytes bound to the column can be eluted after another drying step. The drying steps are necessary to remove water which would have prevented the water-immiscible elution solvents from optimally interacting with the analytes (Figure 3).

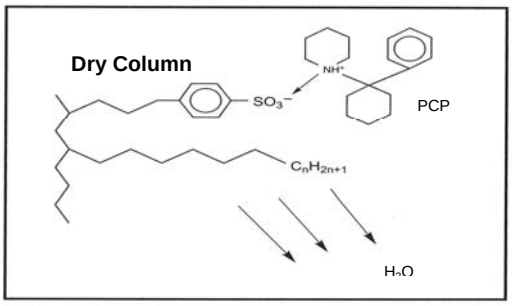


Figure 3

To elute the cationic analytes, an organic solution with a high pH (between 11 & 12) should be used. A methylene chloride-isopropanol-ammonium hydroxide mixture will simultaneously disrupt these ionic interactions and successfully elute the desired compound (Figure 4).

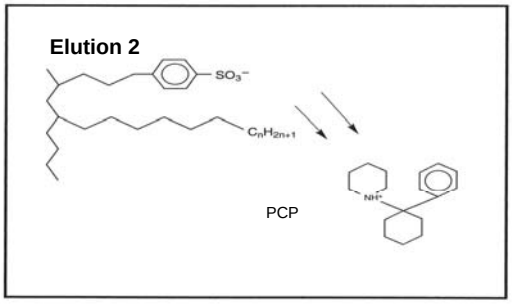
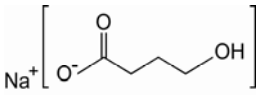


Figure 4

CLEAN SCREEN® Copolymeric Bonded Phases for Drug Abuse Testing

Part Number without Clean-Thru® Tips	Part Number with Clean-Thru® Tips	Sorbent Amount/ Tube Volume	Unit per Pack	Description
DAU				
CSDAU131	CCDAU131	130mg/1mL	100	**CLEAN SCREEN® DAU** column is copolymerized on a rigid, purified silica gel support. The two functional groups include a reverse phase, and an ion exchanger, benzenesulfonic acid. This column is commonly used for analyzing a wide range of drugs of abuse, including acidic, basic & neutral drugs. **Application:** Dual functionality for weak bases and hydrophobic compounds. **% Organic Loading:** 12.30 **Exchange Capacity (meq/g):** 0.072
CSDAU133	CCDAU133	130mg/3mL	50	
CSDAU203	CCDAU203	200mg/3mL	50	
CSDAU303	CCDAU303	300mg/3mL	50	
CSDAU503	CCDAU503	500mg/3mL	50	
CSDAU206	CCDAU206	200mg/6mL	50	
CSDAU506	CCDAU506	500mg/6mL	50	
CSDAU1M6	CCDAU1M6	1g/6mL	30	
ZSDAU005	ZCDAU005	50mg/10mL	50	
ZSDAU013	ZCDAU013	130mg/10mL	50	
ZSDAU020	ZCDAU020	200mg/10mL	50	
CSDAU515	CCDAU515	500mg/15mL	50	
THC				
CSTHC131	CCTHC131	130mg/1mL	100	**CLEAN SCREEN® THC** column is copolymerized on a rigid, purified silica gel support. The two functional groups include a reverse phase, and an ion exchanger, primary amine. This column is commonly used for analyzing THC and its metabolites. **Application:** Dual functionality for acids and hydrophobic compounds. **% Organic Loading:** 12.30 **Exchange Capacity (meq/g):** 0.163
CSTHC203	CCTHC203	200mg/3mL	50	
CSTHC303	CCTHC303	300mg/3mL	50	
CSTHC503	CCTHC503	500mg/3mL	50	
CSTHC206	CCTHC206	200mg/6mL	50	
CSTHC506	CCTHC506	500mg/6mL	50	
CSTHC1M6	CCTHC1M6	1g/6mL	30	
ZSTHC013	ZCTHC013	130mg/10mL	50	
ZSTHC020	ZCTHC020	200mg/10mL	50	
CSTHC515	CCTHC515	500mg/15mL	50	
GHB				
CSTHC131		130mg/1mL	100	The small polar nature of the molecule and the lack of a UV chromatophore complicate the chromatographic and spectrophotometric analysis of GHB. Chemically, GHB is unstable and readily forms Gamma-butyrolactone when heated in acid conditions. Most analytical methods are based upon the interconversion to the lactone and chemical derivatization to form the TMS derivative. This column is for the extraction of free GHB.
CSTHC203		200mg/3mL	50	
CSTHC303		300mg/3mL	50	
ETG				
CSETG203	CCETG203	200mg/3mL	50	**CLEAN SCREEN® ETG** columns are available exclusively from UCT for analysis by LC/MS. This 3mL column contains a proprietary carbon packing material for the extraction and concentration of ethyl glucuronide.
ZSETG040	ZCETG040	400mg/10mL	50	
BNZ				
CSBNZ203	CCBNZ203	200mg/3mL	50	**CLEAN SCREEN® BENZOS** columns are available for benzodiazepine extractions.